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A Monthly Review of Veterinary Science.

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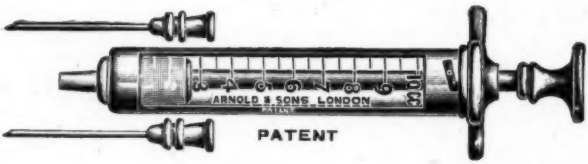

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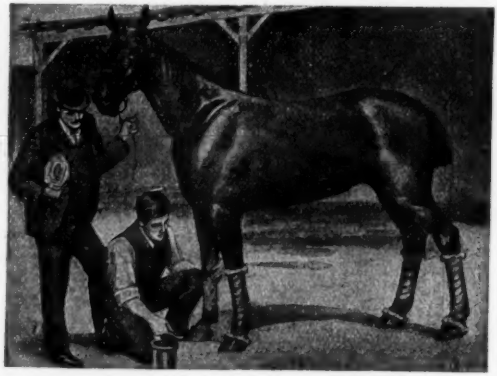

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(See p. 722.)

THE

VETERINARY JOURNAL

DECEMBER, 1910.

Editorials.

"STRINGHALT" AND "SHIVERING."

ELSEWHERE in this issue of the VETERINARY JOURNAL we reproduce a paper on the above subject that was presented and discussed at the meeting of the National Veterinary Association this year. The paper was an excellent stimulus to a discussion which was characterized by the enormous amount of useful and interesting information it contained. Unfortunately, however, it is not possible for us to reproduce that discussion, and members of the National who were not present at the meeting should certainly read it through in their copy of the Proceedings that has been circulated to them. Undoubtedly when Professor McCall undertook the task of investigating these two affections he must have realized the difficulties he had to contend with, and it is not to be wondered at that up to the present he has not been able to elucidate the cause of the conditions or to discover any special lesions associated with them. As was to be expected, therefore, the discussion largely concerned the clinical aspects of the disease, and opinions of the various points were freely given by some of the most experienced members of the profession.

Perhaps the most important matter round which the discussion ranged was as to the intermittent character or otherwise of the affections. The consensus of opinion would appear to support the view that both conditions in mild or early cases may be, and not infrequently are, intermittent. Definite experiences supporting intermittence of stringhalt were related by Mr.

Spreull, Mr. Carter, and Mr. Shipley, while similar experiences of shivering, involving trouble for some of the relaters, were reported by such experienced and careful observers as Mr. Sheather, Mr. Hughes, Mr. A. Wilson, Mr. Sumner, and the President (Professor Macqueen). The latter authority expressed the opinion that "intermittent shivering is so common that no veterinary surgeon is to be held liable for overlooking its existence when the symptoms are not plainly to be seen." Mr. Villar seized the salient point concerning both affections and drove it home with the following summary: "It is a good thing we are able to lay it down that a man cannot be accused of making an absolute mistake because he has described a horse as a shiverer or affected with stringhalt, when other veterinary surgeons who have examined him have not found him affected with either of those diseases."

With regard to the cause, although no definite lesions could be described, it was generally accepted that both conditions are nervous in origin, that both may be hereditary, and that they may remain latent until the animal became affected with some debilitating disease or was subjected to considerable exhaustion. Casting for castration was discarded by all as being a negligible quantity if it existed at all as a cause, since both affections appear to be equally common in both sexes.

It is quite impossible to estimate the value of such discussions, and it is a great pity that more members of the profession do not avail themselves of the opportunities for learning that they offer. Even if they were unable to attend the meetings regularly they would be fully repaid for membership of the National, at any rate by receiving a full report of the proceedings in book form.

There is one great point which we think we should all learn from this discussion, viz., not to be too dogmatic as to the non-existence of certain affections, and especially so in legal cases. In certain possibly intermittent affections, a professional man may be warranted in saying he was unable even after a thorough examination to find any trace of the particular affection, but he is not justified in definitely stating that it does not exist. If this were to be borne in mind and acted upon there would be less distrust and pointing of the finger of scorn by both magistrates and laymen when "experts differ." G. H. W.

MR. BARRETT AND THE FUTURE OF THE VETERINARY PROFESSION.

IN these days of pessimism concerning the future welfare of the veterinary profession it is good to meet with optimism sometimes. The President of the Royal College of Veterinary Surgeons was certainly in an optimistic vein when he visited Glasgow to deliver the inaugural address at the Veterinary College in that city at the beginning of the present session.

It may be retorted that it is customary to be optimistic on such occasions. Be that as it may, we must bear in mind that Mr. Barrett has no axe to grind, and that he is in an anomalous position from which he should be able to survey dispassionately the ups and downs of the profession which he practised in his earlier days. Mr. Barrett does not believe that the time for the veterinary surgeon is past, and we decidedly agree with him. It is an old saying that "As one door closes another one opens." One door is certainly closing to us somewhat, though it will probably never quite close. That, of course, is due to the introduction of motor traction, which has considerably reduced the number of horses used in towns and cities. Mr. Barrett says the pessimists are chiefly men who have been most successful. Perhaps it is that they have the greatest reason for it. We know of one such city practitioner who during the last three years has lost from his contract list almost three thousand horses, which have been displaced by motors. He must have been successful to have held such contracts, yet who under the altered circumstances has greater reason for pessimism?

Fortunately, however, dairy cattle remain with us, and canine work is growing with leaps and bounds, while Municipal and State authorities "are alike beginning to realize the importance of veterinary science in relation to the questions of public health." It remains with us to realize the change, and to keep pace with it, yet we must not allow ourselves to be "side-tracked." We must not lose sight of the fact that our most important function as veterinary surgeons is still to assist in maintaining the health of the domesticated animals and to relieve them when affected by accident or disease.

Mr. Barrett's address, is both interesting and instructive, and well worthy of careful perusal. G. H. W.

General Articles.

"STRINGHALT" AND "SHIVERING."*

By JOHN R. McCALL, M.R.C.V.S.

Professor in the Veterinary College, Glasgow.

THE importance of these conditions and the scarcity of veterinary literature bearing upon them indicates that the time has come when an opportunity such as that presented by the annual meeting of our National Veterinary Association may with advantage be employed in a free discussion upon these obscure but highly interesting diseases. In this way, no doubt, many interesting observations may be recorded, and new facts brought to light which will assist us all in arriving at more definite conclusions than apparently exist at the present moment.

Stringhalt is the term used to define that peculiarity—spasmodic and excessively rapid flexion of one or both hind limbs, which occurs when the horse is made to move, best seen in the slower paces, and particularly in turning or backing. The limb is lifted abnormally high, but is able to support weight and allow of other movement in the ordinary way. This spastic movement is most marked when the animal is first exercised, and if this be continued the symptoms become modified, thus suggesting that a degree of accommodation becomes gradually established between the flexors and extensors of the limb.

The clinical history shows that the disease usually becomes manifest when the horse is put to work, it increases with age and hard labour, and any circumstance which tends to lower the vitality of the subject undoubtedly aggravates the symptoms, *e.g.*, an attack of influenza may make manifest a stringhalt hitherto unrecognized, which may, however, gradually disappear as the patient recovers strength. Excitement will also increase the symptoms, an example of which is frequently furnished in the Hackney Show ring. On the other hand, rest from hard labour has a modifying action, slight cases being difficult to detect after the animal has been laid off work for a few days.

The diagnosis of stringhalt in the early stages is usually an extremely difficult matter; we may suspect the horse, and subject

* Paper read at the meeting of the National Veterinary Association, London, 1910.

him to the most rigorous tests with negative results, yet, probably, were we to have the opportunity of examining him the next day we might have little difficulty in finding that he was affected. This intermittent nature of the malady is important, and should not be lost sight of in law cases where, naturally, the veterinarian is inclined to assume that because he is unable to detect any symptom of the disease, it is consequently non-existent.

If the condition is at all marked, then walking the animal and suddenly turning him to one side and then the other, or moving him backwards and forwards, as a rule causes the characteristic movements; likewise if the horse is made to move over suddenly in the stall he may "pick his hocks." If in doubt subject him to these tests on cobbled stones, because in my experience a slippery surface exaggerates the tendency, and more particularly when the horse is yoked. This applies equally to shivering.

There can be little doubt that stringhalt is most prevalent among heavy draft horses, although we encounter it in the hackney, thoroughbred, and other varieties; it also appears to be fairly common in the ass. At first sight its prevalence in draft horses might suggest that excessive muscular exertion played an important part in its production, especially when we remember that rest frequently modifies the complaint, but if excessive muscular exertion were the cause of the disease it would be of much more common occurence. Admittedly muscular exertion *intensifies* the malady, but probably its effect is limited to this.

The immediate cause of this interference with movement has been sought for in different organs, but up to the present has not been clearly demonstrated. Falke identified the condition with sciatica in man, but the clinical history is absolutely distinct, sciatica being a painful affection, the attitude being due to restriction of movement on account of pain.

Renner took it to be due to chronic inflammation of the ischiatic nerve, but this cannot be accepted, as chronic inflammation of nerves leads to structural alterations in their texture, and causes muscular alterations in their texture, and causes muscular atrophy, whereas in stringhalt, if muscular atrophy ever exists, except as a general emaciation, it is extremely rare, and, moreover, the microscopical examination of the ischiatic nerve fails to disclose structural alterations.

Boccar sought the cause in contraction of the peroneus, after discovering that the condition disappeared on section of this tendon; but this does not stand investigation, for section of the peroneus in many cases is of little or no avail, and even in those cases where it is beneficial it is frequently several weeks after the operation before full results are obtained; this would not be the case were the condition due to such a mechanical cause.

Bone spavin has been included in the list of causes of stringhalt, and while it is possible to have bony ankylosis of the tarsal joint interfering mechanically with the flexion and giving rise to a peculiar form of false stringhalt, this is obviously not the cause of true stringhalt, because in the vast majority of cases of bone spavin there is no stringhalt, and in nearly all the cases of stringhalt which I have examined no evidence of bone spavin could be detected.

Bassi attributes true stringhalt to interference with the movements of the patella. We certainly meet with cases of this description, but the peculiar jerky catch here observed occurs at regular intervals, and is frequently accompanied by a clicking sound, which differentiates this from true spastic stringhalt where the movement is more rapid and rhythmic.

Contraction of the fasciæ of the thigh, or the tensor fasciæ latæ, has been credited with causing stringhalt, but when section of the peroneus tendon fails to produce beneficial results, section of the fasciæ also fails, and those few who have practised this surgical treatment have been unable to report favourably upon it.

Stringhalt has also been identified with chorea minor of man, and with locomotor ataxy. It certainly resembles the former closely in the clonic nature of the spasms, but differs in that stronghalt is *strictly localized* to a certain group of muscles, whereas in human chorea the spastic condition is more generalized—the arms, limbs, and facial muscles frequently being involved, especially under excitement or observation. Stringhalt certainly differs from human locomotor ataxy, not being so much a want of co-ordination and irregularity in muscular movement as a clonic spasm of certain muscles; blindfolding the animal has not, in my experience, exaggerated the symptoms, nor interfered with the balancing power as it constantly does in locomotor ataxy of man. Furthermore, in the human subject sclerosis of the superior column of the spinal cord (*i.e.*, sensory) is practically constant, whereas this is not so in

stringhalt of the horse. Another diagnostic symptom of locomotor ataxy of man is the want of light reflexes, but although I have applied this test to many animals affected with stringhalt, I could never say that any marked departure from the normal could be observed, although the iris of the horse appears normally to respond much more slowly to the light than is the case in the human subject.

In a pamphlet on "Diseases of the Nervous System in Horses," by Chalmers Watson, M.B., M.R.C.P.E., published a few years ago, the author gives a brief description of the condition known in the human subject as lateral sclerosis or spastic paraplegia. To quote: "The clinical features are mainly motor, and comprise muscular weakness and a marked degree of spasticity in the gait. The affected limbs are raised in a spasmodic manner, and put down on the ground with a jerk that is often very striking, and not unlike the type of movement seen in aggravated cases of stringhalt in horses."

Certainly the clinical picture presents a remarkable similarity, but in spastic paraplegia the lateral columns of the spinal cord are invariably affected, and the lesion is a gross one; this has not been found to be the case in stringhalt in the horse.

The symptoms exhibited in true stringhalt indicate that the cause is due to irregularities in the functions of the antagonistic nerves of the lumbar and pelvic plexuses, but whether these irregularities are functional or dependent on structural changes has still to be elucidated.

Hereditary Aspect of the Disease.

Whatever difference of opinion may exist as to the etiology of this affection, the tendency for animals affected with stringhalt to transmit the disease to their offspring has been so long recognized by veterinarians that it is needless to enlarge upon it. Most of us whose vocation brings us in touch with breeding stock have seen many examples, and quite a number present to-day could mention cases of stallions well known in the show rings of Great Britain who are affected with this malady, and whose progeny are notorious for the same defect. It does not always follow that the disease is transmitted provided the dam is free from the defect, but still this is frequently observed. Where both parents are affected the hereditary tendency naturally becomes much aggravated, and this is common knowledge with breeders of horses. It is not usual for foals or year-

lings to show the complaint, still such cases have come under my observation, particularly in hackneys. This hereditary character of the disease is quite in keeping with allied nervous affections in the human family, and there can be little doubt that the hereditary transmission of stringhalt plays a most important part in the perpetuation of the malady.

When we consider to what an extent in-breeding is practised in most of our pedigreed stock, this aspect of the subject assumes even greater significance; breeding with a mare so affected is bad enough, but the results are confined to her limited offspring, whereas in the case of the stallion the effect is much more serious and far-reaching. Is it not time that the veterinary profession were bringing this fact prominently before the notice of the various agricultural and horse-breeding societies, and impressing upon these bodies the urgent necessity for examination of stallions destined for public service throughout the country? Already a few of the more enlightened and influential societies have grasped the situation and acted accordingly, and in the face of powerful opposition, but their example will require to become much more general before lasting benefit will result.

Legal Aspect.

In the case of Anderton *v.* Wright, reported in *The Veterinarian*, July, 1871, after hearing evidence the magistrate, Judge Greene, stated "it was perfectly clear that stringhalt constituted unsoundness," and found for the plaintiff with costs. In the case of Thompson *v.* Pattison, tried before Mr. Justice Cresswell, at the Liverpool Summer Assizes, 1846, his Lordship said "it is a question for the jury whether stringhalt produces those effects which in the eye of the law render him unsound," and in summing up shortly afterwards his Lordship said to the jury, "you have heard the evidence as to stringhalt; if you are satisfied that it is a disease calculated to impair the natural usefulness of the horse you must find for the plaintiff, it being admitted that the horse had it." The jury found for the plaintiff.

Results of Stringhalt.

As previously stated, this malady becomes worse with age and hard work, and few, if any, natural recoveries are recorded; still, the extent to which it advances varies considerably, some animals,

especially of the harness variety, appear to remain much the same for years, provided they are well fed and not overworked. The lorry horse who has to pull heavy loads on slippery streets with steep inclines yields to the malady much more quickly, and although in its initial stages the disease has little effect on his working capacity, the time comes when it undoubtedly impairs his value, incapacitating him from setting back and holding heavy loads coming down hill, and he then commences to break up. At this stage muscular atrophy becomes evident, but it appears to be a generalized condition rather than the local muscular atrophy indicating changes in the spinal cord anterior to their trophic centres.

Case 1.—Female donkey (aged), in good condition, but badly affected with stringhalt, both hind. When first taken out of the stable the hocks were jerked up at every step, but after a few moments exercise the movements became less marked.

Tests Employed.—Blindfolding neither increased the movements nor caused stumbling. Eye reflexes apparently normal, sensation as demonstrated by pin pricks undiminished, myotatic irritability normal. Action of the bowels and bladder normal (thus showing that there was no interference with the vital reflexes in the lumbar region of the cord). Stroking of the panniculus caused twitchings.

Post-mortem Examination.—Naked eye. All the viscera appeared normal; the brain was exposed and removed, both it and the meninges appeared healthy; the pia arachnoid was delicate and transparent all over, and the blood vessels and sinuses apparently normal. The spinal cord was exposed in its entirety and removed; both it and its meninges showed no change. The median and sciatic nerves were excised, and to the naked eye were normal. The tendinous insertions of the peroneus, flexor metatarsi, and gastrocnemius muscles were also incised and removed for microscopic examination: to the naked eye they looked healthy. The various joints of the hind limbs were also healthy.

Microscopic examination of the brain, spinal cord, nerves and muscles, failed to reveal any pathological changes.

The following methods were employed:—

The nervous elements were stained (1) with Hæmolum and Van Gieson to show whether sclerosis was present; (2) by the Weigert-Pal method to show late degredation; and (3) by Marchi to show recent degeneration.

The muscles were stained with Hæmalum and Van Gieson, but showed nothing abnormal.

Australian Stringhalt.

This disease, which in some respects resembles stringhalt in Great Britain, appears to be peculiar to Australia, where it affects large numbers of horses in certain districts. We are indebted to Professor W. T. Kendall, of the Melbourne Veterinary College, and Mr. Edward Stanley, F.R.C.V.S., for particulars of this malady. The following extracts and notes are made from veterinary reports furnished by them to the Minister of Agriculture for Victoria.

In 1865 or 1867 the disease appeared in Victoria; it seems to follow in the wake of Agriculture, and breaks out most frequently in paddocks which have been ploughed and then laid down to grass. As a rule it prevails in low-lying rich lands, and it always comes on suddenly without any assignable cause, and usually about the autumn.

Professor Kendall considers that the malady has three forms—namely, local, general, and acute general.

The local form is the most common and "is characterized by a peculiar jerking action in one or both hind limbs, which may be so slight as to be only noticeable when the animal is suddenly turned round or made to go backwards; but in more severe cases, both hind legs may be so badly affected that progression can only be accomplished by a succession of bounds and plunges extremely painful to witness." In cases where both legs are badly affected, when the horse desires to move forwards, the hind quarters are suddenly elevated, and one hind leg is violently jerked upwards, sometimes so high that the foot strikes the belly and remains so drawn up; the other is then brought up in a similar manner, the former being at the same time suddenly brought to the ground with great force. At other times both hind legs will be jerked up simultaneously, or in quick succession, and the hocks remained flexed to their utmost extent until the haunches almost reach the ground, before the horse has power to bring the feet down.

The appetite is almost invariably good, and the digestive and urinary organs appear to perform their functions properly. This form of the disease seldom proves fatal, and affected animals gradually recover without treatment in from twelve to eighteen months.

General Form.—The fore limbs are generally affected as well as the hind ones, but instead of being jerked up like the latter they are carried stiffly forward, the knee being scarcely bent at all. When undisturbed, a horse affected in this manner may graze and get about without much difficulty, but cannot get along at all when chased or excited, but begins to plunge and flounder about; some fall, and others after making violent struggles to get away, come to a sudden standstill, their heads being elevated and nostrils dilated. If near enough the heart may be heard beating violently.

Acute Form.—The symptoms differ considerably from those of either of the other forms, but as all three are found affecting different animals in the same mobs at the same time and under precisely similar circumstances, it is evident that they are only modifications of the same disease.

There is a dragging in all the limbs and frequent stumbling, the hind fetlocks knuckle over, and the thighs have a thin wasted appearance when viewed from behind. If the horse is made to move any distance he breaks into a perspiration. The attack is usually very sudden; should the horse fall or lie down he may be unable to rise, and struggles violently, but if raised by means of slings he can both stand and walk, and if properly attended to he usually recovers.

Treatment.—Change of pasture, as well as of locality, is one of the surest means not only of preventing the disease, but also for hastening recovery in those already affected. Medical treatment is of doubtful benefit.

Causes.—Eating of so-called dandelion, *Hypochæris radicata*, metallic poisoning from venadium, intestinal worms, rheumatism, ticks, and flies have all been credited with being responsible for the disease, but, upon close investigation, the evidence necessary to incriminate any one of these has been found wanting.

SHIVERING.

Shivering may be defined as an equine disease manifested by irregular and involuntary movements, generally of the hind quarters, accompanied by *tonic spasms* of certain groups of muscles, with marked difficulty or even inability to perform certain movements.

Symptoms.—In the early stages the disease is extremely difficult to detect. Beyond a suspicion of immobility and want of control over the muscles of the hind quarters when the animal is called upon to back, little else can be observed. Even these symptoms are

frequently intermittent and cannot be produced by the most severe tests. An average case of shivering may show no abnormality while the horse is walking quietly forward, but when excited, or suddenly called upon to stop, or set back, or to start forward when yoked, powerful tonic contraction of the gluteal and thigh muscles occurs, the horse arches his back and appears to grasp the ground with his hind limbs as if he were in danger of losing his equilibrium. If the hand be placed upon the gluteal and adductor muscles of the thigh while the horse is forcibly backed these will be felt to become rigid, and well-marked tremors can be seen as well as felt. The tail is frequently elevated and works somewhat in the manner of a pump handle, although the degree of elevation varies considerably in different cases. If turned quickly in a short circle the limbs move in a stiff inco-ordinate way, and in some cases excessive abduction and flexion of the thighs occur, and the pelvis sways in a peculiar manner. Any attempt to pick up the hind limbs meets with considerable opposition ; if successful in the attempt, the muscular tremors can be felt varying in intensity. This feature is frequently the premonitory symptom, hence the shoeing-smith is commonly the first individual to recognize the existence of the malady.

Many shiverers show decided symptoms when taken to the watering-trough, or better still when offered a pail of water on he ground. They become excited, and upon extending the neck muscular spasms seize the hind quarters, the fore feet remain implanted on the ground, the body sways backwards, the back is arched, and the tail jerked upwards. This behaviour, although typical of the disease, is not constant, as there are many bad shiverers that face the watering-trough without a tremor.

Acute Shivering.—This form is fortunately somewhat rare ; still, occasionally such cases are encountered, and many terminate fatally in a few hours. I have in my mind at the moment an interesting case. A contractor purchased a lorry horse at a sale, warranted a good worker, but, on yoking him, was suspicious that he was a shiverer. The horse was sent a journey of nine miles with a light load, and on the return journey had to bring back a heavy load of sand. The weather was hot and the road hilly ; before he had gone far on the return journey the muscular spasms became greatly aggravated, he got highly excited, and broke out into profuse perspiration. Notwithstanding these symptoms, the driver continued on the journey

until the horse came to a complete standstill, and had to be unyoked. His distress and excitement were painful to witness ; he showed spasms of the muscles of the hind quarters, fore limbs, and neck, while the lips, ears, and eyelids twitched convulsively, and he swayed on his legs. He was returned to the seller, but died the same night.

Debilitating diseases, more especially influenza, frequently cause marked aggravation of the disease, the animal in some cases being hardly able to come out of the stable, but as convalescence proceeds these symptoms usually disappear. A sudden fright or shock may also produce marked symptoms of shivering in a horse which hitherto has appeared free from the affection : thus a railway journey has been known to develop latent cases of the disease, and I have known street accidents to have a similar effect. These facts are quite in keeping with like experiences in the human subject, as for example terror, shock or grief precipitating latent insanity, chorea, or other nervous affections. It is, however, recognized that such causes are not sufficient in themselves to produce the disease without a previous susceptibility, which is often markedly hereditary. Docking the tail has been credited with similar effects, probably the nervous shock and subsequent hæmorrhage being here the exciting cause. Cases of shivering are occasionally encountered where the forelimbs are also involved, the knee is not freely flexed, and on attempting to pick up the fore-leg the horse extends it in front of him like a prop, resisting any attempt at knee flexion. When we do succeed in bending the limb, distinct tremors can be felt which exactly resemble the spasms in the hind limb of a typical shiverer. In severe cases of shivering we may meet with muscular spasms of the neck, lips and eyelids, which can be observed when the horse is forcibly backed on a slippery surface, or otherwise excited. The nervous temperament of shiverers frequently shows a peculiar irritability and want of uniformity, one day he works quietly, even sluggishly, the next he is quick, nervous, and excitable ; he may absolutely refuse to do certain work, but on being put to another occupation for a few days he returns to the former job apparently much benefited by the change. Some of these facts would suggest that in such cases the brain, as well as the spinal cord, is implicated in the disease. We have an analogy in the human subject where irritability, emotional excitement, and deficiency in will power (*i.e.*, facile) are frequently associated with diseased conditions where if structural changes occur

they are strictly localized to the spinal cord. This is not to be wondered at when we reflect how intimate is the relationship existing between the various branches of the nervous system.

Causes of the Disease.—In almost all cases shivering runs a chronic course, is incurable, and gets worse with age, hence it is an extremely grave unsoundness; hard work, deficient feeding, and heavy carting on the slippery streets of hilly towns tend to aggravate it. Although the malady is not infrequent in farm horses, they appear to last much longer.

Predisposition and Causes.

Hereditary predisposition is undoubtedly a strong factor in the production of this disease. It is met with most commonly in heavy draft horses, but occurs frequently in the lighter breeds. It usually affects horses when they are put to work, but cases have been observed in young stock that have never been handled. It is said to be more prevalent in Scotland than elsewhere, but this is a matter of opinion, certainly it is not uncommon south of the Tweed.

Apart from the hereditary nature of the disease there is not much actually known as to its cause, and it is remarkable how little has been written on this subject, some of our standard works containing no reference whatever to the disease. The term "shivering" is much more appropriate than chorea, because the tonic spasms of so-called equine chorea are perfectly distinct from the clonic spasms of chorea minor of man or of the dog. Shivering has been compared to locomotor ataxy of man, but close inspection shows that they are distinct, the definite lesion of sclerosis of the superior column (*i.e.*, sensory) of the spinal cord being absent. Blindfolding does not exaggerate the symptoms, nor does it interfere with balancing, neither do the eye reflexes appear to be affected, all of which are typical symptoms of human locomotor ataxy. In the pamphlet on "Diseases of the Nervous System of the Horse" (previously referred to under Stringhalt) Dr. Chalmers Watson reports in detail a case of shivering in the horse in which the stifle joints were both enlarged, and from his description evidently the seat of chronic ulcerative arthritis; he compares the appearances with tabes dorsalis in man—*i.e.*, locomotor ataxy, and concludes that the peculiar joint lesions were neuroptic in origin. It will be interesting to learn from the discussion if veterinarians have observed any connection between stifle joint disease and shivering; personally I regard the conditions as pathologically quite distinct, although they may exist conjointly.

DIAGNOSIS.

There are few duties so unsatisfactory as the examination of suspected cases of shivering, and so long as the disease retains its intermittent character we will have differences of opinion existing, and contradictory evidence in courts of law. We may back the horse, and turn him either in the hand or in harness, pick up the hind limbs and apply the hammer smartly to the shoes, or test him in the stall or at the watering trough with negative results, yet were we to be present when he rises from slumber we might be surprised to notice the rigid position he assumes, the hard tense state of the muscular system, and in some cases the absolute difficulty experienced in standing steadily until the muscular mechanism accomodates itself to the altered position. Some bad shiverers, when they first rise in the morning, present an appearance not unlike the acute stage of tetanus.

CASE 2.—Grey harness gelding, six years old, 14 hands high, badly affected with shivering, involving both the fore and hind limbs. Has been in the possession of the present owner for eighteen months, during which time he has become gradually worse, although he is still fit for moderate work. He has a dull look, is sulky, and inclined to bite in the stable. He walks and turns in a very stiff, tetanic-like manner, and when forced back the tail was freely elevated and arched over the back ; he does not flex either the hocks or knees to any extent, but appear to hold on to the ground and drags his limbs. Sensation from the loins backwards over the gluteal region defective, but from the stifle down appears increased, and he kicks out on being pricked. Great difficulty is experienced in picking up either the fore or hind limbs, and the peculiar muscular tremors are very evident *when any one of these* are forcibly held, or the shoes tapped with the hammer. He can drink from a pail on the ground with ease, although the tail becomes elevated and spasms of the thigh muscles well marked.

Tests.—Blindfolding has no appreciable effect in aggravating the symptoms, nor does it cause any stumbling or interference with balancing. The reflex action of the iris to light appears normal. Myotatic irritability (*i.e.*, tendon reflexes) apparently increased. Stroking the panniculus causes exaggerated twitching. The action of the bowels and bladder are normal, but he shows difficulty in assuming the attitude for micturition, and groans during the act.

Post-mortem Examination.—All the organs appeared normal with

the exception of the kidneys, which were somewhat paler than usual, and the heart which was hypertrophied, weighing 9½ lb., the muscular fibres appeared healthy, but the mitral valves were thickened and somewhat fibroid. All the joints were normal.

The brain and spinal cord were exposed, and there was some congestion of the latter.

Sections of the brain and cord were stained with hæmalum and Van Gieson, also by Weigert-Pal, Marchi and Nissl's methylene blue method, but no abnormality could be detected. The superior nerve roots were also microscopically examined after staining with Hæmalum and Van Gieson and by Nissl's method, but they also presented a normal appearance.

Remarks.

It will be observed from the foregoing notes on the *post-mortem* examinations of the donkey and harness cob affected with stringhalt and shivering respectively, that the microscopic investigation of the nervous and muscular tissues failed to reveal any definite structural lesions, so far as it was possible to ascertain by the most approved, thorough and recent methods. While these results appear disappointing they undoubtedly tend to disprove that *certain definite structural changes* hitherto recorded can be the essential cause of these diseases. Such absence of recognizable structural lesions, however, is not confined to equine shivering and stringhalt, as many grave nervous diseases in the human family, *e.g.*, chorea, epilepsy and even old-standing cases of insanity, have up to the present time remained unidentified with any definite lesions. Of recent years the theory of the *toxic origin* of many nervous affections has steadily been gaining ground, the symptoms exhibited being attributed to toxins present in the body acting upon the central nervous system, and the liability to such intoxication being distinctly hereditary. Little is known, however, regarding the nature of these toxins or whether they are formed as a result of faulty metabolism, or perverted secretions.

When we review the whole circumstances of Australian stringhalt, as recorded by Keddall, they appear to strongly support the toxic theory.

In conclusion, I desire to express my gratitude to Dr. Ivy McKenzie, M.D., Director, Western Asylums Research Institute, Glasgow, and Dr. Robert Macnab Marshall, M.D., Senior Assistant

Physician, Royal Asylum, Gartnavel, Glasgow, who are responsible for the microscopic part of the work, for the enthusiasm with which they interested themselves in the subject, and for the painstaking manner in which they carried out the intricate duties of the research.

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TWO SHEEP DISEASES.

BY STEWART STOCKMAN, M.R.C.V.S.[1]

Indexed B. A. I.

(1) THE CRUELS.

THIS is a disease which seems to be fairly prevalent on certain farms in Scotland. Attention was particularly called to it owing to its appearance amongst a lot of ewes which had been brought as lambs from Scotland to the South of England, four of which were sent to the Board's laboratory by the owner.

The disease is characterized by sores on the lips, swelling of the face, and the appearance of cold abscesses along the course of the lymphatic vessels. Apparently the disease begins in the neighbourhood of the lips. The abscesses vary in size from a pea to a small walnut, in bad cases they extend down the lymphatics of the neck, and they may be found in the substance of the lungs. The contents of these abscesses is not like ordinary pus. The material is of a pale yellow colour, rather waxy in appearance, and very glutinous in consistence.

The disease does not appear to affect very seriously the general health of the sheep until the lungs become invaded, or unless the site of the multiple abscesses interferes with swallowing. Two kinds of bacteria have been found in the pus, and a considerable number of experiments and cultural observations have been made with them. I do not propose to give these observations in detail, as no proof of pathogenic action has yet been obtained in connection with the cultures. Indeed, although there can be little doubt that the abscesses

[1] From his Annual Report for 1909 to the Board of Agriculture.

result from bacterial infection, and it seems not improbable owing to the distinctive characters of the pus and the regularity of the symptoms that they are caused by a specific virus, inoculations performed with the actual pus on sheep and other animals have given negative results. The only experiment which gave anything approaching a positive result was one in which a lamb, aged about 4 months, cohabited with and fed out of the same trough as three affected ewes. After seven days' cohabitation the lamb became distinctly ill, showed slight swelling of the lips, and a few small sores appeared on the skin of the muzzle. The illness lasted about ten days; temperature 104·8° to 105° F. The lesions healed in seventeen days, however, and although the lamb has been under observation for several months there are no signs of abscesses.

The disease had been diagnosed as "caseous suppuration of sheep." This, however, seems to be an error, for the bacillus of "caseous suppuration" can be easily identified, and it is not present in the pus in the disease under discussion. Moreover, the lesions are quite different from those of "caseous suppuration."

(2) Scrapy.

This is a disease of sheep which is only known in a limited area of Scotland, but it has been reported that the area is extending. On the latter point, however, the evidence available is not convincing, and it is difficult to get full information on account of the reticence observed by farmers.

Apparently the disease only affects ewes after they have had two or three crops of lambs. The symptoms are rather peculiar, and may at first be confounded with scab. One of the first signs is an itchy condition of the skin, which gradually becomes worse, and compels the animals to constantly rub themselves against fixed objects. The skin, however, shows no eruption, as in the case of scab, and no acari can be found. The affected animals become very much emaciated. Small abscesses, which are probably only the indirect result of the disease, may appear at various parts of the body, particularly about the head. Eventually the animals die from emaciation if they are not previously slaughtered, but affected animals may live on in a miserable condition for several months. Dipping has no curative effect; on the contrary, it seem to intensify the symptoms. If we accept the local statement that the disease is spreading, one is justified in thinking that this may be a disease which is transmissible either by direct or indirect infection. It has not been possible to obtain a great deal of

material, and from local inquiry by one of the Board's Veterinary Inspectors it would appear that shepherds and farmers are inclined to class more than one disease with totally different symptoms under the head of Scrapy, although some of the ailing animals do not show the most prominent symptom of scratching, from which the disease has apparently received its local name. In the case of one animal which had been affected for several months, a condition of the bowel somewhat resembling that present in Johne's disease was discovered at the *post-mortem* examination. Acid-fast bacilli, indistinguishable from those found in Johne's disease, were also present in large numbers under the microscope in a small area of the intestine. This important lesion, however, which seemed at first to throw an unexpected light upon the cause of the disease, has not again been discovered in a very restricted number of autopsies which it has been possible to make on other affected animals. A considerable number of experimental observations have been undertaken at the laboratory. These, however, have not yet matured, and it is thought advisable to submit to a prolonged period of observation the experimental animals which have been exposed in different ways to what for the moment may be called the hypothetical infection.

Reform in Blinkers in Hamburg.—The horses of Hamburg have reason to congratulate themselves. Blinkers now are allowed there only if they stand well away from the horse's eyes. The number of towns in which blinkers are being done away with is steadily on the increase. Berlin was the first to start the reform by abolishing them altogether, through the influence of von Borries, chief of the police. Dusseldorf, Ostrowo, Aachen, Konigsberg, and Cassel followed. In Darmstadt they are allowed only when found necessary, and now in Hamburg only if wide open. In many cases these "blinkers" become veritable "squinters," as they allow the horse to look only straight in front instead of all round, as he naturally would. Formerly no one outside the Animal Protection Societies cared at all about the troubles of the horse, and they were powerless. Since, however, Berlin made a start, there are many cases to show that horses can be driven safely without blinkers. We now only want energetic workers to extend the movement.

Clinical Articles.

TWO CASES OF LAMINITIS TREATED WITH ADRENALIN.

By Captain A. J. WILLIAMS, F.R.C.V.S., A.V.C.
Mounted Infantry School, Longmoor, Hants.

Case 1.—*Subject:* A transport horse of the Mounted Infantry, aged 13 years.

History, &c.—Previous entry on the veterinary history sheet: Laminitis both fore feet; admitted for treatment January 6, 1910; discharged to duty on January 23, 1910. On September 1 last the horse was admitted for treatment very lame on both fore, with the usual symptoms of an acute case of laminitis. Temperature 102·4° F.; pulse 40 and very full.

Treatment.—The shoes were removed and the hair over the region of the digital arteries clipped and area painted with iodized chloroform. Adrenalin hydrochloride 1 in 1,000 solution 1 drachm, and normal saline solution 3 drachms, was prepared, and a fourth part injected into each side of both fore pasterns below the fetlocks, at 1.30 p.m. The animal was placed in a loose box and aloes 4 drachms given.

3 p.m.—No improvement. Temperature, 103° F.; pulse, 64. Tucked up appearance, and grunts when made to move. Poultices applied.

September 2, 1910.—A great improvement this morning; feet cool; pulse not so full, and the patient moving much better. 1.30 p.m.: Adrenalin injected as before. 3.30 p.m.: Very lame again; shows as much difficulty in moving as when first admitted. Grunts when made to move; physic acting well; clay poultices applied.

September 3, 1910.—Moving very well, trots fairly freely; exercise for one hour twice daily; hose applied to feet, and standing in clay in loose box.

September 4, 1910.—Moving freely; continue exercise.

September 5, 1910.—Shod with bar shoes and turned into a paddock.

September 12, 1910.—Continues to do well.

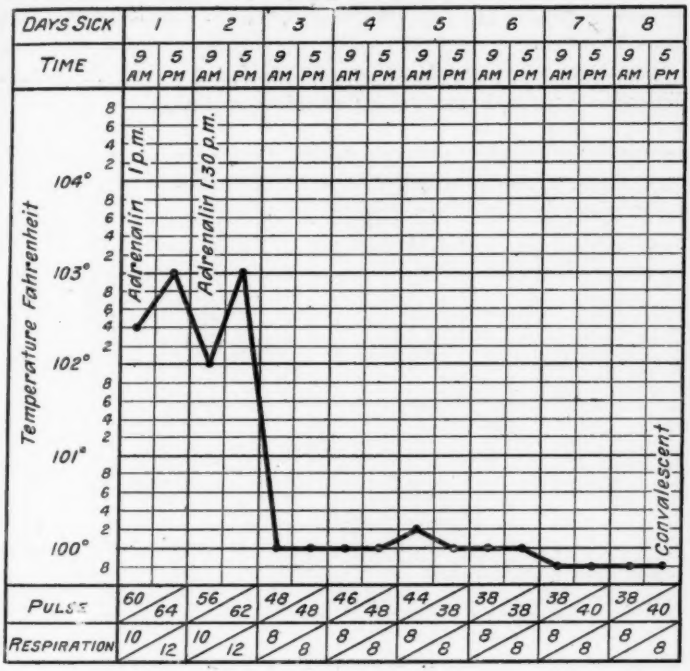
September 15, 1910.—Relapse this morning. Temperature, 102·2° F. Marked laminitic gait, but not as bad as when first admitted. Adrenalin injected at 1.10 p.m. 2.30 p.m.: Much worse; temperature, 104·2° F.; pulse, 100; respiration, 20; lying down in great pain; could only rise with great difficulty, and unable to move. Chloral hydrate,

½ oz.; warm poultices. 5 p.m.: Temperature, 104·8° F.; pulse, 108; respiration, 22.

September 16, 1910.—Horse up and moving fairly well; temperature, 102·2° F. Aloes 4 drachms given. One hour's exercise.

September 17, 1910.—Doing well; clay poultices; continue exercise.

September 19, 1910.—Patient moving well. Shod with bar shoes; two hours' exercise. Shuffling gait remains.



CASE I. Chart 1.

September 30, 1910.—Discharged and sent to light work. Noted for casting, unfit for further service.

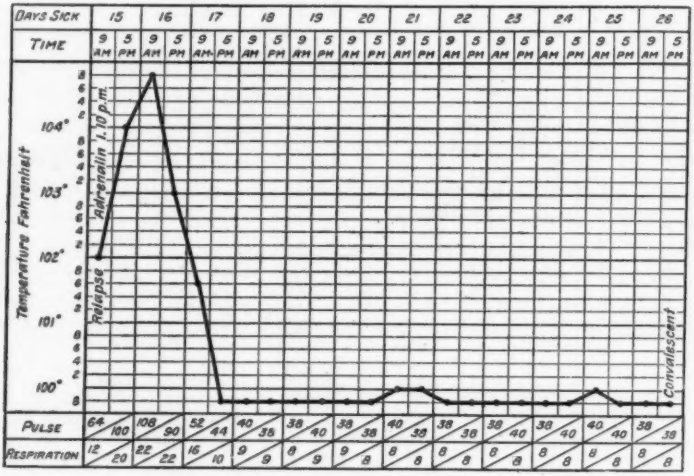
There was no further improvement, and the animal was cast and sold.

CASE 2.—Army Service Corps horse, attached to Mounted Infantry.

On September 25, 1910, the horse did a 23-miles march from manœuvres; it was a very hot day and a trying march; at the end of the march the horse was exhausted.

On the morning of September 26 the horse was brought to the sick lines with great difficulty, and dropped down soon afterwards. Feet very hot, pulsation in digital arteries marked, temperature 103·2° F., pulse 100, respirations 60. At 10.30 a.m. adrenalin injected, same as in Case 1. About twenty minutes after the injection the horse got up; at 11.15 he was able to shuffle along well; after ten minutes forced exercise he could be made to do a shuffling trot. Continued exercise for half an hour, poultices applied and aloes 4 drachms given.

September 27, 1910.—Much worse, could not move. At 5 p.m. still unable to move, in great pain; poultices applied.



CASE I. Chart 2.—The Relapse.

September 28, 1910.—Temperature 102·6° F., pulse 100, respirations 48. Injected adrenalin at 10.45 a.m. At 11.45 a.m., lying down, cannot get animal on his feet; 2.30 p.m., still down, brighter, eating a little mash; hose applied to feet and clay poultices.

September 30, 1910.—No improvement; adrenalin injected 4 p.m.; managed to get animal on his feet with great difficulty, but could not move him out of the box.

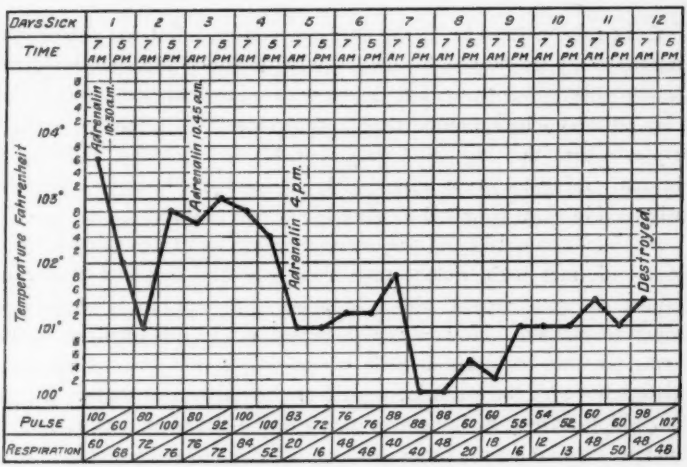
October 2, 1910.—Managed to get horse outside for a little exercise but with great difficulty.

October 5, 1910.—Getting worse, knocking himself about, and

spends most of the time lying down; general condition very bad, extremely tucked up. Temperature 101·4° F., pulse 107, respirations 48.

October 7, 1910.—Case considered incurable and animal destroyed.

Remarks.—Case 1 showed no improvement till the morning after adrenalin was injected; thinking another injection would probably be followed by further improvement, it was carried out, with the result that two hours afterwards the animal was in a far worse condition than before the injection, followed by marked improvement again the following morning.



Case II.

On September 15, 1910, there was a peculiar relapse; injection of adrenalin was followed by a marked rise of temperature, increase of pulse and respirations; condition much worse all round. Again there was marked improvement the morning following the injection; the attached temperature chart shows this well.

Case 2 was a very acute case, and one in which I thought adrenalin would probably give favourable results, but it failed to reduce the severity of the attack in any way. I saw the case soon after the animal dropped outside the sick lines; there seemed no hope of the animal getting on his feet by himself, or being able to support his weight if he was lifted up; it was astonishing to see him get up about

twenty minutes after the injection, and seeing that he could be made to do a shuffling trot within an hour from the time adrenalin was used, I had hoped it would turn out to be a successful result, but this wonderful improvement was not maintained, and further injections had no effect.

TWO INTERESTING CASES OF FOREIGN BODY IMBEDDED IN THE PALATE.

By GEORGE D. MARTIN, M.R.C.V.S.

Westcliff-on-Sea.

Case 1.—On June 22, in the evening, a large adult fox terrier was brought to my surgery by his owner, who informed me that he feared his dog had injured his mouth in some way, or had something stuck in his throat. The symptom that had attracted his attention particularly was that the dog could only open his mouth about half way or less, and trying to yawn immediately caused the animal to howl piteously as if in great pain and to close his mouth again at once.

Examination externally was without result, and attempting to open the mouth met with violent resistance from the dog, and as soon as the mouth was opened about half he shrieked and struggled in desperate fashion. However, with perseverance and much patience, it was possible to locate a small wound in the left side of the hard palate level with the posterior border of the last molar tooth. Palpation, which, as may be imagined, owing to the situation, was extremely difficult, showed considerable swelling which rendered it impossible to say definitely what was the cause of the condition, but probing carefully showed some foreign body present, wood or bone.

By this time it was obvious that resort to chloroform was the necessary course, but bleeding was so copious that it was feared asphyxia might result. Presently I was successful in removing a small splinter of wood, quite black and about 1 in. long by $\frac{1}{8}$ in. thick. Further inquiry elicited the information that the dog had been seen playing with a piece of stick about a fortnight previously, since which time he had been dull and off feed, and the symptoms described above had gradually become more noticeable.

On a diet of liquids, with appropriate antiseptic powders, the patient made an uneventful recovery.

Case 2.—The evening of August 27 brought me an exactly similar

case to the above in a well-grown vigorous Airedale dog, of some 11 months. This dog had been noticed playing with his "stable companion," a collie, in the afternoon, with a longish piece of stick, and the Airedale had been observed to suddenly give a gulp and go away and lie down by himself. His owner, trying to find out the cause of his depression, in the evening found that opening the mouth caused much distress, and sought my assistance.

A preliminary examination, made with great difficulty, owing to the struggles of the dog, a very strong animal with most powerful jaws, showed a small punctured wound on the left side of the hard palate in exactly similar situation to that in the case previously described. The dog exhibited such great distress and his struggles were so violent that chloroform was administered, and on further examination a foreign body of the size of one's little finger could be detected lying longitudinally in the tissues of the part. Enlargement of the wound to permit of introduction of forceps made it possible presently, after some considerable and difficult manipulation, to withdraw two pieces of wood, the halves of a round piece of dead wood 2½ in. long by ½ in. thick. Hæmorrhage was trifling, and after dressing the wound with antiseptics a sedative was given and the patient put to bed for the night.

The dog was very subdued and inclined to lie about for some three or four days, but under saline and sedative treatment with a diet of milk, soup, &c., recovery was uneventful and he was discharged quite normal again on the ninth day.

CASTOR OIL POISONING.

FRANK CHAMBERS, M.R.C.V.S.

Umtata, South Africa.

It is not often that the cure is worse than the disease, but such a case happened through the too energetic use of a parasiticide by a small farmer in a town on the Cape Natal border recently.

A smear from a cow which had died on the farm was sent in for examination. The *Piroplasma parvum* was in abundance and naturally East Coast fever was diagnosed. I got into communication with the Government Stock Inspector for that district and learned that many cattle were dead and several were sick from what was thought to be East Coast fever. Not being far away I journeyed to the farm to see what appeared to be an interesting outbreak of that terrible

scourge, for the farm was completely fenced in and very free from ticks.

On arriving at the farm I found that twelve cattle were dead and nine of the remaining fourteen were ill. To keep the cattle free of ticks the owner had been smearing his cattle weekly with a smear of his own concoction. It was composed of equal parts of castor oil and antifriction grease. Nothing happened for several weeks until the one cow died of East Coast fever, and in a few days many cattle became ill and twelve died in rapid succession.

The natives were busy skinning the dead cattle and cutting off the tit-bits for their own consumption, so there was little trouble in making several autopsies. The *post-mortem* appearances were in every case identical. The mucous membrane of the rumen was inflamed in patches and readily peeled off. The mucous membrane of the abomasum was intensely inflamed and in places was ulcerated. The lungs, liver, and kidneys were normal. In two cases the small intestines were inflamed. All the animals went down to the water to die and the natives opened them there, allowing the contents of the stomachs and intestines to pollute the stream regardless of who might be using the water below.

From the *post-mortem* appearances I came to the conclusion that these cattle had not died of East Coast fever, as the lesions of that disease, viz., infarcts on the kidneys, &c., were absent. Moreover, smears taken from the spleen and lymphatic glands on being examined failed to show Koch's bodies or any other parasites.

After the cattle had been smeared they naturally licked off as much as they could possibly reach, for any substance like grease on the skin is regarded by a bovine as most objectionable and he does his level best to get rid of it, usually by licking it off.

In this way it is plainly evident that a beast would if smeared once a week consume a large quantity of castor oil in time with ill effects.

The remainder of the cattle with the exception of five old bullocks were visibly ill. The legs were swollen tremendously; this being due to the irritant action of the prolonged use of castor oil, and there was a dropsical effusion in the region of the dewlap.

The cattle experienced great difficulty in walking owing to the pain caused by the flexion of the blistered joints. The thin parts of the skin, such as that under the tail and between the hind legs, was badly blistered. The temperature of the affected animals was

normal. The pulse was slightly accelerated. Diarrhœa accompanied by an intense thirst was a constant symptom.

Treatment consisted in advising the owner not to smear the cattle again, but to go in for dipping or spraying as soon as the cattle were fit. Tincture opii. and spt. ether. nit. in cold flour gruel was prescribed with evident success, as all the sick animals made a good recovery.

UMBILICAL HERNIA—OPERATION BY DEGIVE'S METHOD—DEATH.

By E. WALLIS HOARE, F.R.C.V.S.
Cork.

Subject.—A yearling filly.

History.—The hernia was not of large size, but the opening was rather wide. Having had good success in a previous case with Degive's method, I decided to again adopt it.

The case progressed favourably until the tenth day, when the animal went off her food and started to purge severely. The temperature rose to 106° F. and the general appearance of the animal was unfavourable. The clamp had partially separated from the skin and was removed; a large surface denuded of skin remained. The purging continued for two days; the animal lay down for long intervals, no tympanites present, but the abdominal muscles were hard and the abdomen "tucked up." No distinct pain present, expression of countenance haggard, pulse quick and weak, respirations accelerated and thoracic in character.

Next day the animal was weaker, and lay down continuously; sweating was profuse, and abdominal muscles hard and contracted. As the case was hopeless, the animal was destroyed.

Autopsy.—On examining the hernial ring, it was found that the adhesions between the edges were very weak and the surrounding muscular tissue attenuated. On inserting the finger, it was found that intestinal contents were free in the abdominal cavity. Further examination showed a minute opening in the cæcum and the latter was attached by adhesions to the hernial ring. Lesions of septic peritonitis were present.

Remarks.—It seems hardly likely that the intestine could have been caught by the clamp at the time of operation, as symptoms would have appeared early.

The first symptoms shown—viz., severe purging—is not what

one would expect in the primary stages of peritonitis. Probably I enclosed too much tissue in the clamp at the time of operation, and this may be a point of importance when carrying out the procedure in future.

In the other case, in which I adopted Degive's method, the progress and result were most satisfactory.

The difficulty in the operation, to my mind, comes in with reference to the insertion of the needles, so as to get the necessary depth, without taking up too much tissue. If too little be taken the clamp is likely to slip below the edges of the ring and fail to bring about the desired adhesion. However, one learns by the commission of errors, although the experience is often very expensive.

"MAD" STAGGERS.

By E. WALLIS HOARE, F.R.C.V.S.

Subject.—A 5-year-old harness mare.

History.—The animal was in high condition and had been doing very little work lately.

On the evening of June 2, she was observed to be in pain, lay down and rolled a few times and moved with an unsteady gait.

The owner administered a drench composed of spt. æth. nit. ʒiii., ol. lini. Oiss.

The animal became very violent, rushing about the stall, falling in a helpless manner, struggling with fore and hind feet; she rushed against the side of the stall and inflicted a deep wound on the forehead, exposing the bone.

I attended her at 10 p.m., and found that previous to my arrival she had been given with great difficulty by my foreman a drench composed of chloral hydrate ʒi., ol. lini. Oiss. It was very difficult to approach her, as she would without any warning rush forward and fall. The pupils of the eyes were largely dilated, the pulse full and quick, slight tympanitis was present.

As it was impossible to administer a bolus, I prescribed aloes Barb. ʒvii. in the form of drench, and gave calomel ʒii., ol. croton ♏x. made into electuary and placed on the back of the tongue.

The symptoms gradually abated and the animal became quiet. Next morning all evidences of cerebral excitement had disappeared, and the physic acted moderately; free purging, however, started in the evening.

The wound, which was very jagged and extended to the forelock,

was dressed with tr. iodine B.P. and covered with cyanide gauze, wool and bandage. It healed without any suppuration.

Remarks.—The cerebral symptoms in this case must be regarded as reflex in character. Some may think that the amount of purgative agents administered was rather excessive, but in cases where brain symptoms are present I find that ordinary doses have no effect.

AN INTERESTING PIGEON CASE.

By GEO. H. WOOLDRIDGE, F.R.C.V.S., M.R.I.A.
Professor in the Royal Veterinary College, London.

The photographs herewith reproduced illustrate a case which is quite unique in my experience.

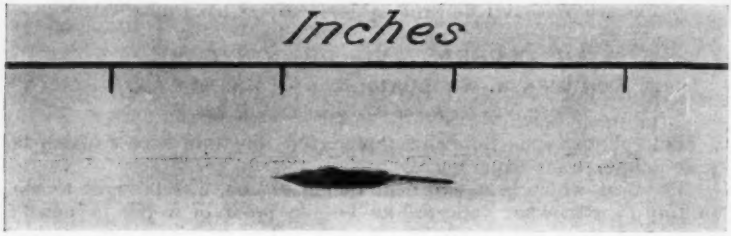
The bird, which is an excellent racing pigeon, was brought to me on July 13 with what appeared to be the point of a pin or needle protruding from the middle of its back. The bird had been racing the previous week, but the owner had only noticed this condition during the previous day. On examining the offending body closely by

Pigeon shewing Pin protuding from the back.

pulling away a few of the short feathers round it, it was found to be protruding a little over a quarter of an inch. The point for an eighth of an inch was clean, and for the remainder of its visible portion it was coated with firm inspissated exudate. It was then grasped firmly with forceps and extracted, and proved to be a pin with the head partially removed by some means. The catarrhal coating of the pin, as may be seen by the second photograph, extended a little more than half an inch, and the rest of the pin was clean-looking but discoloured. On withdrawing the pin it was followed by a tiny speck of exudate, which was wiped away, and the puncture soaked in chinosol solution 1 in 500 and dusted with powdered boric acid. The bird made an uneventful recovery. The pin was re-inserted into its track for taking the first photograph.

This is another example of the resistance of birds to ill-effects from wounds. It is probable that the pin was making its way by a fistula

from the gizzard, which is very strong and muscular, and the pin was very sharp. It is improbable that any other viscus would be powerful enough to drive the pin through that position, close to the middle line of the back.



Pin after removal.

The photographs (which, of course, are not on the same scale) were kindly taken for me by Mr. A. L. Sheather.

MAJOR-GENERAL ROBERT PRINGLE, C.B., D.S.O., M.R.C.V.S.

THE position of Director-General of the Army Veterinary Corps is the highest reward the Service can confer upon those who select to follow this branch of the profession, and to attain such a position is the ambition of every veterinary officer. The selection of Colonel Pringle and his consequent promotion to the title of Major-General has given universal satisfaction, for if one point has been noticeably stronger than another in the career of the new Director-General it is that of tactful administration and organization.

Born at Stranraer in 1855 and educated in Scotland, he is one of the students to whom the Glasgow College can point with pride. He joined the Army Veterinary Department in 1878, just in time to see active service in the Afghan Campaign of 1879-80, for which he holds the war medal. He was in the Waziri Campaign of 1881, where he was mentioned in despatches, and the Zhob Valley Expedition of 1884.

Later, for services rendered during the South African War, he received the D.S.O. decoration, and was again mentioned in despatches, being promoted to Lieutenant-Colonel. At a more recent date still he was made a Commander of the Bath. Nearer home his responsible positions have included those of Principal Veterinary Officer for Ireland, and the same position in the Aldershot Command; whilst in India, on the retirement of the late Colonel Nunn, he was appointed Principal Veterinary Officer.

In the world of sport he is well known as a good rider to hounds, a good polo player, fond of racquets and other outdoor active pursuits. In the selection of Major-General Pringle by the authorities at the War Office the profession may rest assured that the veterinary military portion is in safe hands, and that the Army Veterinary Service will continue to progress as steadily forward during the next five years as it has done during the administrations of distinguished gentlemen who have preceded him.

Canine Clinical Notes.

VARICOCELE IN THE DOG.

By E. WALLIS HOARE, F.R.C.V.S.

Cork.

Subject.—A foxhound.

History.—The dog was sent in for surgical treatment, as in consequence of the great length of the scrotum and the position of the testicles he was constantly getting these organs injured while hunting. On examination, the spermatic cords were found to be of inordinate length, and on palpation very thick, and a marked pulsation could be felt; the testicles hung very low and were much smaller than normal structures.

Castration was advised.

Local anæsthesia was induced by means of injecting eucaine and adrenalin, one injection being made over the median line of each testicle, and one into each spermatic cord.

After about ten minutes local anæsthesia was perfect; one testicle was exposed, and the spermatic cord was found to have the spermatic veins enormously enlarged and in a varicose condition; the spermatic artery was also much larger than normal. A ligature of celluloid thread was applied to both artery and vein as high up as possible, and the testicle and portion of the cord were removed.

The other spermatic cord was in a similar condition and the same procedure was adopted.

Shortly afterwards there was continuous hæmorrhage from one side of the scrotum, and firm pluggings with cotton-wool failed to arrest it.

A further examination showed that the ligatures were perfect, but that the hæmorrhage came from a dilated artery in the lip of the scrotal wound. This vessel was ligatured, and the case made a good recovery, the scrotum shrinking up so that the animal was fit for hunting purposes.

Remarks.—One lesson to be derived from the above case is that hæmorrhage after castration does not always arise from the spermatic artery.

SOME NOTES ON THE TREATMENT OF DISTEMPER IN DOGS WITH NUCLEIN.

By JAMES PEDDIE, F.R.C.V.S.

Dundee.

It is well known there is no disease which taxes the powers of the veterinary clinician more than distemper, and we are ever ready to adopt any measure that is supposed to strengthen our hands with regard to its treatment.

Like the poor, distemper is always with us, and few veterinary surgeons (at least those in town practice) have long to wait for cases coming along in order to try any new remedy. During recent years a good many veterinary surgeons have tried nuclein in various animal affections, but I am not aware of any very definite pronouncement with regard to its value in the disease now under consideration. Distemper has been very prevalent in this part of the country for a considerable time, and in the beginning of this year I determined to give nuclein an extended trial with a view to ascertaining its merits in this disease and placing same on record. The following cases of distemper will give some idea of the success met with :—

Case 1.—Curly-coated retriever dog, 9 months old, had been ailing for at least a week before I was called. The animal when seen was in a very thin and unthrifty-looking condition, was discharging from the eyes and nose and had a very troublesome cough, with occasional vomition; pulse 130 per minute, temperature 104·6° F., the respiration hurried, and the appetite in abeyance.

Diagnosis.—Distemper associated with broncho-pneumonia. The animal was given a hypodermic injection of nuclein, and put on a mixture containing potass. citratis, mist. heroglycerine co. and a bitter. It was removed from an open kennel and put into a comfortable shed, as the weather was cold. The nuclein injection was repeated daily for three days, then it was put on a mixture containing nuclein solution in one drachm doses night and morning in addition to the mixture already prescribed. In a few days the improvement in the animal's condition was noticeable, and at the expiry of a week or ten days it was very marked indeed. The temperature and pulse had fallen, the cough was not nearly so troublesome, and the appetite was wonderfully good. The nuclein was continued until the tenth day, and the animal made a steady and uninterrupted recovery.

Case 2.—Yorkshire terrier, bitch puppy, aged 7 months; discharging from eyes and nose, slight throaty cough, pulse 110, tem-

perature 103.2° F. The animal had two or three fits before it was brought to me, and was in a very miserable-looking condition. Nuclein was given in 10-minim doses three times daily *per orem*, and a mixture containing the following drugs thrice daily: Pot. brom., ammon. brom., chloral hydras, spt. chlorof., and a bitter. The administration of nuclein was continued for a fortnight. The bitch had another fit on the second day after I had examined and prescribed for it, and but for that it made a somewhat slow, although complete, recovery. The same owner also consulted me about a spaniel bitch puppy which from the symptoms described I had no doubt was also suffering from distemper, as it had been running about with the other dog. The symptoms described were: discharge from eyes, husky cough, occasional sickness, slight diarrhœa, off feeding, and very dull and lifeless. I was given the weight of the dog, and prescribed nuclein in mixture form three times daily. The owner, writing me three weeks later with regard to the dogs, made this observation: "The spaniel is getting on very well also; she is running about as hardy as ever."

Case 3.—Flat-coated retriever dog, aged 4 years, weight 70 lb. The animal had been ailing for fully a week before I was consulted, and had lost flesh considerably; discharge from eyes and nose, from the latter very profuse; in the mornings the nasal openings were almost occluded, cough troublesome, the fauces were much infected, and there was considerable bronchitis, breath fœtid, and bowels irregular. This case was treated as No. 1, with injections of nuclein daily for three consecutive days, and on the third day the temperature had fallen from 104·6° F. to 102·4 F., and the general condition was much improved. A mixture containing nuclein in 2½-drm. doses was prescribed, and this was continued night and morning for four days, at the end of which time the improvement was very decided; the animal had regained much of its lost spirit, and was feeding fairly well. The nuclein was continued for a few days in doses of 1 drm. once daily, and the dog made a steady and uneventful recovery.

Case 4.—Pedigreed bull bitch, aged 8 months, weight 33 lb. This animal was brought to me for treatment after the remedies prescribed by the all-knowing chemist had failed to produce any improvement. The bitch was obviously very ill, thin, and pinched-looking, discharging from eyes and nose, tongue furred, breath very fœtid, vomiting and diarrhœa; temperature, 105° F.

The prognosis was most unfavourable. Nuclein in 1-drm. doses

was given three times daily, and powders containing 20 grn. of tannoform were given at intervals to check the diarrhœa. As the animal was very weak, brandy, along with Valentine's meat juice, was administered three times daily. The second day after admission partial paralysis of the hind quarters was observed; the animal could not walk without frequently falling over to one side, and there was also twitching of muscles. At this period a very distressing symptom was added—viz., fits of whining, which occurred at frequent intervals, but fortunately only lasted for a few days. The nuclein was administered until the fourteenth day after admission. At this date the bitch was greatly improved, and feeding moderately, but it could not walk without still falling over to one side. It was given pills containing quinine, iron, and strychnine, twice daily. The animal was kept in hospital for six weeks, and at the end of that time, although it was greatly improved in condition, it could not walk any distance without occasionally falling to one side, although much less frequently than before. I advised the owner to have her sent to a farm in the country, where I saw her about a month ago, and was agreeably surprised to see that she had completely regained control of the hind quarters, was in splendid condition, and quite vigorous.

Case 5.—Samoyede bitch, aged nine months, had been to a show and developed distemper, subsequently the earliest symptoms being the usual discharge from eyes and nose and diarrhœa. The owner treated the dog for ten days at least with the assistance of the local doctor, and it was only when frequently recurring fits were added to the symptoms described that I was called in to see her. The bitch presented a pitiable spectacle, the tail and hind quarters were matted with the dark and fœtid discharges from the bowel, and with the salivation and rolling about during the fits she looked as if she had been drawn through a manure pit. There was marked twitching of the facial muscles, and the bitch was very irritable, a condition which was increased by the least fuss or noise. The pulse was 140, and weak, temperature 104° F., respirations irregular and somewhat cyclic in character. The treatment given was nuclein three times daily, and a mixture containing potass. and ammon. brom., chloral, spirit of chloroform and syrup of orange, every six hours. As soon as the animal was sufficiently quietened with the bromide mixture it was given a good hot bath in order to clean it. The fits recurred at less frequent intervals, but the bitch became quite paralyzed in the hind quarters. The paraplegia continued, and the bitch gradually

sank into a marasmatic condition, and died during the course of the third week after the treatment had commenced.

Case 6.—Field spaniel dog, pedigreed 10 months old, had also been to a show and contracted distemper which manifested itself in the gastro-intestinal form with vomiting and diarrhœa. Nuclein was administered three times daily. The diarrhœa was very troublesome, and the discharges particularly offensive. For this condition powders containing salicylate of bismuth, with small doses of calomel ($\frac{1}{8}$ gr.) were given with good results. In the course of a few days there was a very marked improvement, and the puppy made a steady and complete recovery.

Case 7.—Irish terrier dog, aged 18 months, had been ailing for about a fortnight before I was consulted. The symptoms presented were free discharge from nose and eyes, with a corneal ulcer on the left eye, husky irritating cough, bowels rather relaxed. There was a well marked eruption on the abdomen and thighs in this case. The dog was very thin and tucked up in the belly. Nuclein was given three times daily, the eyes were douched with boiled water, and argyrol and atropin solution instilled. After a few days the diarrhœa became very severe with a good deal of straining and a considerable admixture of blood with the discharges. Bismuth salicylate in full doses combined with morphia was given at frequent intervals until this symptom was controlled. During the second week of treatment the improvement was very decided, the corneal ulcer eventually healed, but left a considerable pigmentation behind which slightly infringed on the cornea. With the exception of a slight recurrence of the diarrhœa, the dog continued to improve and made a good recovery.

Every veterinary surgeon with experience of dog practice is well aware of the protean nature of the symptoms manifested in distemper, and the cases I have selected for description serve partly to illustrate this point. I could go on describing many others of which I have a record, but as they follow more or less closely on the lines of those given, it seems superfluous to detail them and would only unnecessarily prolong this article.

I have in all treated thirty-two cases of distemper with the aid of nuclein solution (veterinary), and have only had four deaths, a percentage of recoveries which I could not have hoped for with the treatment previously adopted. Nuclein is said to produce an increase in the number of white blood cells, with a corresponding increase in the germicidal power of the blood. It seems reasonable to assume that

an agent having this action should be valuable in an infectious disease such as distemper, and certainly the cases I have treated with it so far have led me to form a high opinion of its value in this disease. I had no experience with regard to the dosage of nuclein, but Messrs. Parke Davis and Co., whose preparation I used, informed me that they had found 1 minim per pound of body weight when injected hypodermically, and 2 minims per pound of body weight when given *per os*, quite sufficient, and my dosage followed very nearly on those lines. In the cases where I administered nuclein hypodermically. I had no trouble at the seat of injection. The nuclein was diluted with an equal volume of normal salt solution when given hypodermically.

I consider the dieting in a case of distemper of the greatest importance. Where there is vomiting and diarrhœa the food should be absolutely cold. The food should always be of the lightest possible character, such as milk, to which may be added switched white of egg, boiled white fish, and well-boiled tripe, to both of which a little wheaten flour may be added; boiled rice with milk, lactol, boiled rabbit, cold beef jelly, raw lean beef, minced, &c., &c. I am a firm believer in Valentine's Meat Juice for tiding a patient over a crisis, although it is expensive. It is given in cold water, and brandy can be administered with it.

In conclusion, I would just like to add that the majority of the cases of distemper which I have treated with nuclein have not been by any means mild ones, and I have not got them very early, as I find there is a growing tendency for people to dabble with remedies advertised in the various dog papers before consulting a veterinary surgeon.

It may be argued that I have had a special run of luck; that may be so, but I am, nevertheless, firmly of opinion that nuclein is a most valuable agent added to the list of remedies which we have at our disposal in the treatment of distemper.

CANINE PIROPLASMOSIS IN MADRAS.

Indexed P. A. I.

In his report on the micro-biological section of the King Institute of Preventive Medicine at Guindy, Dr. F. M. Gibson, the Acting Director, publishes a Progress Note by Captain W. S. Patton, I.M.S., the Assistant Director, on his protozoological investigations, in the course of which he refers as follows to the great loss sustained last December by the Madras Hunt in the death of a number of the hounds from what turned out to be canine piroplasmosis:—

Last December the hounds of the Madras Hunt became ill and the Honourable Mr. W. O. Horne, I.C.S., Hunt Master, applied to the Institute, in order to ascertain the nature of their disease. The examination of the blood of the sick animals has resulted in the discovery of a new pathogenic piroplasm of considerable interest. It was conjectured that the hounds probably acquired the parasite from the familiar jackal (*Canis aureus*) which is regularly hunted in the suburbs of Madras. I was fortunate in being able to shoot a jackal in broad daylight, and in its blood the identical piroplasm which was first found in the blood of the sick hounds was at once discovered. The blood of this jackal was inoculated into three bazaar dogs, two of which had had a recent attack of *Piroplasma canis*. The three dogs showed this new piroplasm in their blood after an incubation period of fifteen to sixteen days. A number of other dogs were inoculated with the blood of a hound, and four of these have also become infected, one of which died of the disease after twenty-three days.

The parasite is commonly seen in the blood of an infected dog as a small ring, either with a large single mass of chromatin or two masses, one of which is much smaller. It may be pyriform or oval in shape and some forms are seen to be amœboid. It is about half the size of *P. canis*, and its protoplasm is much less voluminous; the typical double pear-shaped bodies so characteristic of the common piroplasm of the dog are rarely seen. The disease is much more chronic, slow in onset, causes extreme anæmia, enlargement of the spleen and liver and great emaciation. In bazaar dogs fever is not a marked accompaniment, but in the hounds the temperature frequently rose to 106° F. Trypanblau has no effect on this parasite. For this new piroplasm of the jackal I propose the name *Piroplasma gibsoni*, in honour of Dr. Gibson, who first saw it. The complete description of it and the disease it produces will be published in due course. A few of the hounds were also found to be infected with a trypanosome, probably *Trypanosoma evansi*. This organism is also being studied in dogs, and its method of transmission will, it is hoped, be found in time. —*Madras Times.*

Abstracts and Reports.

GLASGOW VETERINARY COLLEGE.

Introductory Lecture.

By WM. FREEMAN BARRETT, F.R.C.V.S.

President of the Royal College of Veterinary Surgeons, London.

At the very outset of my speech I am anxious to make one little confession, and it is this, that when I received a letter from Mr. Russell containing the invitation of your Governors to deliver the introductory address to you, I was very much surprised, because the view at once crossed my mind that I did not profess to be either a medical or veterinary scientist, nor could I call myself a skilled veterinary practitioner, and for this reason, that thirty years ago I was attracted by the study of the law, and I am afraid I somewhat abandoned the profession in which I was earlier trained. But although for many years, as I have said, I have been engaged in the pursuit of another profession, I have never lost my love for the old one. Gentlemen, I am just as anxious to-day that the veterinary profession should succeed as I was when a student in the Camden Town Veterinary School. I have not prepared a scientific lecture; I have come for another object. I have come essentially to thank the Governors of this Institution for what they have done for you, and for what in the future they will do for the profession. I felt that if I were to sit down and write a dry paper I would thoroughly fail in conveying to them the due appreciation of the sentiments which I entertain of what they have done for you, and I desire to thank you and the Governors for the honour done me in asking me to come here.

But, gentlemen, other reasons prompted me to come here, and one particular reason was this, that a day or two after I received the letter from Mr. Russell I received another letter from my esteemed and respected friend, your Principal, and it was one of his typical letters—one of his kind, courteous letters—and he seemed very anxious that I should address you, and I felt I owed it to him and to your Governors that I should come to Glasgow this day. Certain particulars have been supplied to me with regard to the Glasgow College, and after what I have been told and seen, I must confess that I am surprised at the size of your buildings and of the class-rooms.

Gentlemen, having regard to the premises available to you for the purpose of teaching medical science, you have here almost commodious buildings. What you are lacking in at the present time is the number of your students. When the parents and guardians of Scotland ascertain with more precision what is the outlook of the profession, instead of the number of students at the College being 50, you will have not less than 150.

Now, gentlemen, I find that this College was founded and affiliated in the year 1863, and from then until last year no Government aid was given to it. There have been many difficulties in the conduct of

the work here. During these years science has gone ahead by leaps and bounds, and I can imagine the struggle which our old friend the Principal must have had in carrying on the work of this institution. There is no man in this room who does not appreciate the important work which he has done, but I believe this institution has now been taken over by the Government, which will enable the work to go on with more smoothness. I find that since this college was established no less than 3,000 students have graduated from it, and the great majority of them have done well in their profession, and have been a credit to the institution in which they were educated. I find that the entire buildings have been purchased from the founder by the Governors, with money subscribed by the landowners, live-stock proprietors, and others, including the citizens of Glasgow, and I think the landowners and subscribers generally ought to be thankful for what has been done.

Your Principal has been good enough to hand to me one of your prospectuses. First of all on the list of Governors is the name of Lord Pentland. I understand this nobleman has taken a very great interest in this institution, and that it is largely due to his initiative and influence with his colleagues and to his kindness that you have received Government aid. I think it is my duty, as representing the head of the profession, to thank him for all he has done. I think I should also mention the name of Sir John Struthers, Secretary to the Scotch Education Department, who has been greatly interested in this work. I have likewise before me a list of Governors in which are contained many eminent names. I think I will, in justice to all, run over some of the representatives who are here to-day.

Sir Hugh Shaw Stewart, who is unable to be present, has always been a great friend of the profession, and there is our Chairman, Mr. J. Campbell Murray, who is a very good Chairman indeed. As he takes a great interest in the work, we are very much obliged to him for coming here to-day, and showing his interest in the Glasgow College. Then you have the representatives of the County Councils of Lanarkshire, Ayrshire, Argyllshire, Kirkcudbrightshire, and Buteshire, representatives from the University, the Glasgow and West of Scotland Technical College, the University Court, the Senate, the Town Council, the Highland and Agricultural Society, the Glasgow Agricultural Society, the Glasgow School Board, the Dumbarton County Committee, the West of Scotland Agricultural College, and lastly, I think I ought to refer to the citizens of Glasgow.

Now, gentlemen, passing on, sometimes I wish I had been born in Scotland. And I think it would have been an advantage too had I been born in Glasgow. What strikes me of being of so much importance is this, that you enjoy educational facilities in Scotland which we in England do not. I would especially allude to one scheme initiated at the instance of your Governors and by Principal McCall. I understand from what Principal McCall told me—I was very much surprised as well as very pleased—that the parents of any boy in Scotland may appeal to the Secondary Education Committee of the County Council with regard to the education of their boy. I understand that certain inquiries are made in regard to the position of the parents, in regard to the educational fitness of the boy, and in regard to his character. If these be approved there is a recommendation

made by the Secondary Education Committee to the County Council that a bursary of £20 a year be accorded to the boy. I understand that some boys have availed themselves of this and have entered this college. When such a system prevails, especially if that system be extended, the doors of the college will be open to almost the poorest lad in the land. We in England, unless our fathers are able to help us to a great extent, and unless a lad possesses brain power of an exceptional kind, have no hope of ever becoming a member of this learned profession. I hope, therefore, the parents will avail themselves more largely than they have done in the past of the advantages which accrue to them through their sons becoming members of this institution.

It is often said that the time for the veterinary surgeon is past. It is said that the invention of motor cars will render the services of the veterinary surgeon unnecessary. That in my mind is absolute nonsense. I do not myself remember the time when railways were built in this country, but I am told that the men of that time thought there would be no further use for horses. Farmers accordingly were induced to give up the breeding of horses, and the result was that that class of stock was never so dear as they then were. Although motor cars may become more numerous, the trade of the country is increasing by leaps and bounds, and the time has not yet come when even the carriage horse can be done without.

I now desire very briefly to allude to the choice and prospects of the profession. There are some pessimists, and curiously enough they are those who have been most successful in the profession. There is a desire that the veterinary profession should not be overcrowded. but I would say this, that the veterinary profession is not nearly so overcrowded as the profession of the Bar. I would like to point out that there are many other channels which in the course of a few years will be open to the veterinary profession. The Municipal and State authorities are alike beginning to realise the importance of veterinary science in relation to the questions of public health, and particularly as touching the meat and milk supplies of the community. The authorities are very much alive to the fact that the veterinary surgeon can help them with regard to these supplies, and I think those around me who are interested in agriculture will agree with me that the milk supply at the present time is anything but satisfactory. I happen to be associated with the London County Council, and during last year we have had between four and five thousand samples of milk taken, and you will be surprised to hear that of that number no less than 10 per cent. contained tubercle bacilli. Of the cows which we have had inspected by the veterinary surgeon, very nearly 3 per cent. are affected with tuberculosis of the udder. Acute tuberculosis in children is occasioned by the consumption of milk from such cows, and if that be so, the authorities will in a very short time seek the aid of the veterinary surgeon, so that the milk supply may be made more pure. Some use, no doubt, is being made of tuberculin, but I cannot help thinking that the municipal authorities and the agriculturists of the country have as yet failed to understand the very valuable services which the veterinary surgeons are capable of rendering. I regret very much that the Milk and Dairies Bill, introduced by Mr. Burns, was allowed to drop, because I believe he was promoting it on wise

and correct lines. There can be no doubt at all that serious efforts will be made in this direction, and that the services of the veterinary surgeon will be in more request than in the past.

Then there is the question of Government positions. The State may require the services of the veterinary surgeon, and I am quite sure those who desire to become qualified will find they have no difficulty in securing very good positions. There is not one unemployed man who has left this college, and some of the positions obtained are, what I would call for young men, somewhat lucrative.

In the case of the Colonies there is an increasing demand for the services of veterinary surgeons in the stamping out of contagious diseases and other work. During the past session three graduates of this college received Colonial appointments, one at a commencing salary of £450 a year, together with free passage and all travelling expenses for a period of three years. If that young man conducts himself properly—as I am sure he will, coming from this college—within four or five years he will be in receipt of £1,000 a year. The others have gone out at a salary of £500 along with free passage and all travelling expenses. I have known of barristers who have practised for twenty years without earning £500 a year. Then there is the ever widening field of canine practice. That is one of the most pleasant kinds of practice in the profession. You have made your election, and I think I may safely and honestly congratulate you on your choice. As a veterinary surgeon you cannot expect to amass a fortune, but you can easily earn a decent competence. It is something to do that and to spend your lives in the relief of pain and suffering in the dumb creation.

Now, gentlemen, I desire to offer a few words of encouragement and advice to those who are being trained for the A examination. To my mind this is the most trying examination of them all; it was certainly so, so far as I was concerned. I have been told by a student that this examination is in the nature of an obstacle race. I confess that getting over these hurdles is no mean feat. Most young men who come to college have been engaged in country work or play. They may have been playing cricket or football, with the result that the muscular system has been developed at the expense of the brain power. Consequently when they come to college and problems are put before them, they are often unable to grip the principles. But I might tell you this, that, if you work on steadily, honestly, and fairly, all these difficulties will vanish in a very short time. You will begin to dip into some of the mysteries of Nature's laws. After some months of study you will begin to lift one tiny shred of Nature's curtain. What is there behind that curtain? There are innumerable mysteries behind it. As you go on and your mind becomes expanded you will discover how little you know, and how very much there is to be learned. You will learn by-and-bye of the mysteries which surround you. Among other things you will be able for the first time to understand what combustion consists of, and what forces are set in motion when a lump of coal is thrown upon the fire. To you it will seem wonderful that the heat which has been stored up in it for centuries has by the agency of man been again presented to us for our necessities and our enjoyment. The man who does not learn that fact with interest and appreciation has no real reason to pursue

the cause of scientific study. Chemistry is one of the most interesting sciences. You will learn something of the composition of the earth which appears so diversified, and yet you will find that possibly very few elements enter into its composition. Take also the spectroscope. You will be taught something with regard to that wonderful instrument, which tells not only of what elements the earth consists, but what the elements in the heavenly bodies are. I think you will be surprised and interested when you are told by your learned teachers that the composition of the elements which constitute the earth is similar to those which are contained in the heavenly bodies. You will be told that there may have been a time when these bodies were connected with one another. That will give you some idea of the many mysteries which surround you. They cannot fail to interest your minds. They cannot fail to invigorate you in the pursuit of your studies, because I think the more you learn the less you feel you know, and this is how the mind of the scientific man becomes expanded.

Then with regard to the study of botany. I must confess that when I went to college I did not enjoy botany. I thought—unwisely, I afterwards discovered—that it was somewhat of a useless science. There was a great amount of detail in relation to it, but, gentlemen, I very soon discovered how fallacious that argument was. You cannot learn too much of botany, because it is a very wonderful science. Take, if you will, the known garden plants you see every day. The common buttercup will become something more than a mere plant with a yellow flower. Its delicate cellular structure will have been revealed to you; you will have discovered that it has even to breathe in order to live, and that it takes in carbonic acid gas and gives out oxygen, and thus Nature restores the balance. Further, it has reproductive organs just as skilfully and delicately arranged as ours. Thus botany forms an intensely interesting study.

Gentlemen, let me mention one other subject, which to me was almost unknown—bacteriology. We had microscopes, and we used them for ascertaining the cellular structure of the body, but I had hardly heard of any bacillus. It was about this time that Pasteur announced the important discovery of the *Bacillus anthracis* as the causative agent of the deadly disease anthrax. The vast importance of his discovery was not then realized, but I well remember a discussion which took place among the students, one or two of whom expressed the view that, if anthrax were due to a bacillus, it was not unlikely that other contagious diseases, such as consumption, diphtheria, small-pox, foot-and-mouth disease, and so on, were due to other bacilli.

Since my time at college the correctness of that supposition has been established, and now we know that many of the infectious fevers are occasioned by a living organism of the most minute dimensions, and of the utmost tenacity of life. It procures admission into, and propagates itself with wonderful rapidity within the body, and directly or indirectly in many cases it even arrests the functions upon which life itself depends. What a field for investigation there is open to you! Now, you students, let me beg of you, if I may, in the most earnest manner, to use your microscopes daily, and perhaps one of you, who knows, may discover the causative agent of cancer and render himself famous.

With regard to the practical part of your business I feel I am on safer ground. In any discussion of scientific matters I have to be very careful. I might easily make a slip or two. It is almost twenty years since I examined a horse for soundness, but much that you learn when young does not depart from you when you are old. It is very curious how the youthful mind, being trained in one particular direction, remembers the impress which was then created upon it. It is the last stage of your college career and a very important stage it is, because the student who fails to thoroughly grasp the theory of medicine and surgery cannot expect to succeed in after-life. Unless he is able to appreciate the diagnostic symptoms which are likely to present themselves in any given case, he is bound in practice to make very many mistakes. I found myself, as a young man, that I had great difficulty in diagnosing those diseases in which the symptoms presented were of an obscure character. You should especially remember the diagnostic symptoms of each disease, and when afterwards a series of symptoms are presented to you which on the whole tend to confuse the diagnosis, learn to eliminate by careful reasoning the diseased conditions which are unlikely to be present until you have arrived at the probable cause of the trouble. I can give you one illustration. I was once sent to examine a horse which was unwell. I made an examination of the animal, and discovered that it was suffering from broken wind. I prescribed for it and gave certain directions in regard to the diet and method of treatment. I told the owner his horse would never recover. I could give it some relief, but he was never to expect it to be sound. I went away for a holiday, and for that period I engaged a *locum tenens*. The latter examined the same horse, told the owner it was suffering from bronchial catarrh and would soon recover. He unwisely advised different treatment and gave it medicine for a fortnight, but as the animal failed to recover the client lost all confidence in the young surgeon and would never have him again. You must learn to appreciate the symptoms which are presented to you, and refer them to some particular diseased condition; if your knowledge is meagre, your diagnosis will mostly be erroneous, and your client will be displeased with you. It is essential, therefore, that you study efficiently the theory and practice of veterinary medicine and surgery, and you have ample facilities for such study here. You have as your principal my old friend, Mr. McCall. I think I may say, that perhaps for more than fifty years he has been engaged in teaching veterinary medicine and surgery in this college. I think I may also say that there is no teacher in this country who is skilled and so anxious to impart his knowledge to students as is Principal McCall.

Might I, gentlemen, in the kindliest manner possible, ask you to take advantage of his unique learning and experience? Absorb knowledge from him as often as you can, take it so long as you remain here, that when you leave this college you may say, "I understand the profession so far as a young man can." It is essential indeed that you should when qualified, exercise wisdom and care in the advice you give. How often a young man fails in practice because he has not sufficiently thought out the answer which should be given to inquisitive clients. You cannot be too careful in this respect. Always seek first to help your client. That is the principal aim in

professional life; he will early discover that you are studying his interests and will come to you with confidence for your advice, and that is what you want. No man can live by new clients. Let me also suggest this. I have seen many young veterinary surgeons who were rough in their manipulation of their patients. That does not impress your client. I particularly refer to canine patients. They are usually delicate little creatures. If you are rough with them the client will be inclined to consult some one else next time. Sometimes clients are rude to the veterinary surgeon. They have been rude to me; they have mistaken my object; they have failed to grasp the benefits that I was conferring upon them. Let me give you this advice; if they should be rude and unkind to you, resent them in silence, always remembering the maxim that "He who makes an enemy will one day or other lose a friend."

Gentlemen, I do not think I have much more to say. It is essential that you should pursue your studies with great zeal. The Governors of this College, if I may say it, have been good to this school, to the profession, and therefore you have a duty to them. They have given you extended facilities to learn your profession; induce them to feel by your energy that you are grateful to them. Then when you leave this College remember that you have become a member of a profession which is advancing by leaps and bounds, a profession which has not yet attained to that position in the State to which it is legitimately entitled. You will have become a member of a profession which even yet, I regret to say, is not adequately recognized by some medical men. Sometimes just a few medical men are yet inclined to look down upon the veterinary surgeon. Your preliminary education is on equality with his, your scientific education is equal to his, and therefore if you leave this institution less scientific, less learned than the medical students, you have not done your duty to your parents, to your College or to yourselves. Each one of you will either elevate or lower the veterinary profession. Remember this when you leave: You should never do one thing that your Principal would not have you do. If you adhere to this maxim there is before you a career of prosperity and pleasure. May I just finish by repeating to you the words of Smiles:—

> "Pitch thy behaviour low, thy projects high,
> Thus shalt thou humble and magnanimous be;
> Sink not in spirit, he who aimeth at the sky
> Shoots higher much than he that means a tree."

I hope success will attend your efforts, and that this College will grow and prosper in its noble work.

VSP 23. p 1816

HEREDITARY UNSOUNDNESS IN HORSES.

*Notes on Evidence as to the Hereditary Character of Certain Pathological Conditions constituting Unsoundness in Horses (Principally Ossification of the Lateral Cartilages—Sidebone) Furnished by Examination of 2,636 Cases.**

By S. S. CAMERON, M.R.C.V.S., D.V.Sc.(Melb.).

Present Lack of Recorded Evidence.

Ossification of the lateral cartilages of the foot of the horse, commonly known as "sidebone," has been somewhat indefinitely classified as an "hereditary unsoundness" by various writers during the last half century. On the other hand, perhaps the majority of breeders and a number of authors have strenuously denied the influence of heredity as a causal factor, alleging that the ossification developed as a result of external injury or the unequal incidence of concussion brought about by the use of calkin shoes. Arguments, and experience of isolated instances, have been relied on by both sides, and no definite proof has been given whereby the doubts of the contenders might be set at rest. It does not seem to have been realized that the controversy was one capable of settlement by observation and record of the occurrence or otherwise of sidebone in the progeny of side-boned or sound parents throughout a series of generations in different families of horses; or perhaps, if it was so realized, the opportunity for making such observations and records has not been presented in most countries. At all events, no such observations have been recorded.

As late as twenty years ago, when the British Royal Shire Horse Society was contemplating the introduction of compulsory veterinary examination at its annual show, the question of the unsoundness to be classified as "hereditary," was remitted to a Committee of the Council of the Royal College of Veterinary Surgeons. No definite records being available, the Committee included sidebone amongst the unsoundnesses "considered" to be hereditary. Since then the same lack of definite records is apparent, and I have not been able to unearth any statistics relating to the subject. Even modern authors have been content to repeat the "general idea" as to the hereditary character of sidebone without furnishing evidence of records of examination. As instancing the unsatisfactory character of the evidence available on the point, the following quotations from present-day standard authors may be adduced:—

Williams ("Principles and Practice of Veterinary Surgery," 4th edition, p. 330): "It is generally admitted that the predisposition to sidebone is hereditary, and many breeders of the best class of cart-horses, being aware of the fact, are careful not to breed from an animal with them."

Hayes ("Veterinary Notes," 7th edition, 1906, p. 280): "Hereditary predisposition is well marked in this disease."

* One of four contributions to a Thesis presented to the University of Melbourne for the degree of Doctor of Veterinary Science, November, 1909. Published in the *Journal of the Department of Agriculture of Victoria*, Australia, which is the journal referred to in several parts of the thesis.

Reeks ("Diseases of the Foot of the Horse," 1906, pp. 365, 369, 370): "Sidebone constitutes one of the recognized hereditary diseases. Is sidebone hereditary? We can best answer that by saying that some several years ago the Council of the Royal College of Veterinary Surgeons, at the request of the Royal Commission on horsebreeding, drew up a list of those diseases 'which by heredity rendered stallions unfit as breeding sires,' and that in that last list was sidebone. Sidebones, therefore, are hereditary."

Axe ("The Horse in Health and Disease." 1st edition, vol. vi, page 387): "Sidebone is one of the most pronounced of hereditary diseases. Its tendency to arise in the progeny of affected animals is now known to every horsebreeder of experience."

Mollar and Dollar ("The Practice of Veterinary Surgery," page 630): "The causes are (1) congenital predisposition, in heavy coarse-bred horses."

Other pathological conditions constituting unsoundness which are generally regarded as hereditary are:—

Ringbone (exostosis at the distal extremity of the *os suffraginis* and on the *os corona*);

Bone Spavin (anchylosis with exostosis of the small bones of the tarsus—*the cunieform parvum, medium and magnum;*

Curb (sprain of the *calcaneo-cuboid* ligament);

Roaring (paralysis with atrophy of all the intrinsic muscles of larynx on the left side except the *crico-thyroideus*).

The following are also, but less commonly, classed as hereditary unsoundness:—

Bog Spavin (bursitis with permanent distension of the synovial capsule of the tibio-astragalus articulation or true hock joint);

Thoroughpin (bursitis with permanent distension of the sheath of the *flexor pedis perforans* tendon of the hind limb);

Navicular Disease (caries of the bursal surface of the *os naviculare;*

Nasal Disease (osteo-porosis), and

Chorea ("Shivering" or "Nervy").

The remarks made with regard to the absence of definite observations concerning heredity character of sidebone may be even more forcibly applied to all but one (roaring) of the above-mentioned unsoundness. Concerning the others, no exact evidence has ever been recorded to my knowledge. The following references from standard authors, relating to the more important of these unsoundnesses, indicate the usual attitude adopted when discussing their hereditary character. The tendency is for each author to launch an *ipse dixit*, rather than to furnish proof or refer to evidence:—

Ringbone.

Williams ("Principles and Practice of Veterinary Surgery"): "Hereditary predisposition is sufficiently proved and acknowledged. I therefore simply advise breeders of horses never to breed from a sire or dam having ringbones."

Goubaux and Barrier ("The Exterior of the Horse-French"): "The influence of hereditary has been recognized for a long time. Certain families of horses invariably transmit them to their descendants."

Axe ("The Horse in Health and Disease," vol. v., page 205): "Horses with upright pasterns, and animals with pasterns of undue length are specially predisposed to it."

Mollar and Dollar ("The Practice of Veterinary Surgery," page 607): "The existence of the disease in two or more feet suggests hereditary predisposition, and may often be traced to small, badly shaped joints or defects in the formation of the limbs. . . . Such conformation, being perpetuated in the progeny, renders it easy to understand why the disease is often inherited."

Bone Spavin.

Hayes ("Veterinary Notes," 7th edition, 1906, page 254): "Hereditary predisposition plays a large part in its production. . . . Bad conformation of the hocks has undoubtedly a predisposing influence."

Mollar and Dollar ("The Practice of Veterinary Surgery," page 721): "The intimate structure of the bones and ligaments may predispose to disease, as shown by the inheritance of spavin, and its occurrence in entire strains whose hock joints appear perfectly formed."

Curb.

Axe ("The Horse in Health and Disease," vol. v., page 300): "The causes . . . must be considered under two heads—viz., predisposing and exciting; of the former, heredity is a marked factor quite apart from conformation, for it is noticeable that the produce of some horses and mares . . . show a special liability to the disease."

Hayes ("Veterinary Notes," 7th edition, 1906, page 56): "Animals which have suffered from curb ought not, as a rule, to be used for stud purposes, for the conformation that renders a horse liable to this injury is often transmitted to the offspring."

EXAMINATIONS MADE.

The systematic examination of stallions organized by me as Chief Veterinary Officer, and carried out under my direction during the past three seasons in Victoria, has afforded an opportunity of ascertaining the proportionate incidence of most of these unsoundnesses in the different breeds or classes of horses, and the age-period at which they occur, and also of determining in some degree the extent to which certain of them run in families.

The observations which have been made—together with the records of relationship of sound and unsound horses—will, I think, furnish a material contribution to the evidence establishing the hereditary character of sidebone at all events. It is unfortunate that the records in most cases have reference to only the paternal side of the breeding of the individual horses examined; for there is no reason to believe that the hereditary influence of the dam is other than equally as potent as that of the sire. Indeed, the conclusion is almost irresistibly forced that, in the case of some of the families dealt with, the number of unsound descendants recorded would have been much greater but for the preponderating influence of "sound" blood on the dam's side.

Up to the present, under the Victorian scheme for the Government examination of stallions for unsoundness,* a total of 2,636 have been examined; 779 light horses, 558 ponies, and 1,299 draught horses.

TABLE I.—ANALYSIS OF UNSOUNDNESSES OF STALLIONS REFUSED CERTIFICATES, 1907.

UNSOUNDNESSES.	DRAUGHTS		LIGHTS		PONIES		TOTALS	
	Number Examined, 403		Number Examined, 301		Number Examined, 214		Number Examined, 918	
	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected
Sidebone ...	82	20·35	3	·99	—	—	85	9·25
Ringbone ...	9	2·23	4	1·32	2	·93	15	1·63
Spavin (bone) ...	3	·74	15	4·95	1	·46	19	2·06
Curb	—	—	6	1·99	6	2·80	12	1·30
Bog Spavin and Thoroughpin	2	·49	4	1·32	—	—	6	·65
Cataract (eye) ...	—	—	—	—	1	·46	1	·10
Totals ...	96	23·82	32	10·63	10	4·67	138	15·04

TABLE II.—ANALYSIS OF UNSOUNDNESSES OF STALLIONS REFUSED CERTIFICATES, 1908.

UNSOUNDNESSES.	DRAUGHTS		LIGHTS		PONIES		TOTALS	
	Number Examined, 501		Number Examined, 295		Number Examined, 199		Number Examined, 995	
	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected
Sidebone ...	99	19·76	1	·33	—	—	100	10·05
Ringbone ...	20	3·99	7	2·37	3	1·50	30	3·01
Spavin (bone) ...	3	·59	8	2·71	—	—	11	1·10
Curb	—	—	8	2·71	2	1·00	10	1·01
Bog Spavin and Thoroughpin	15	2·99	3	1·01	—	—	18	1·80
Roarer	—	—	2	·67	—	—	2	·20
Totals ...	137	27·33	29	9·83	5	2·50	171	17·17

* What this system is, how it was introduced, and the work that has been carried out under it, may be gathered from a perusal of the three first (1907, 1908, and 1909) Departmental Reports concerning it, which are published in the December, 1907, July, 1909, and April, 1910, issues of this Journal.

Certificates of freedom from hereditary unsoundness have been issued in respect of 1,954 horses (74·5 per cent.), and 417 (15·75 per cent.) have been refused certification as being found affected with one

TABLE III.—ANALYSIS OF UNSOUNDNESS OF HORSES REFUSED CERTIFICATES TO 5/10/09 (FIGURES EXCLUSIVE OF 32 N.Z. EXAMS.).

Unsoundnesses.	Draughts		Lights		Ponies		Totals	
	Number Examined, 395		Number Examined, 183		Number Examined, 145		Number Examined, 723	
	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected
Sidebone ...	81	20·50	—	—	—	—	81	11·20
Ringbone ...	11	2·80	3	1·64	1	·69	15	2·07
Spavin (bone) ...	1	·25	2	1·09	1	·69	4	·56
Curb	—	—	5	2·73	2	1·38	7	·97
Bog Spavin and Thoroughpin	—	—	1	·55	—	—	1	·14
Totals ...	93	23·55	11	6·01	4	2·76	108	14·94

TABLE IV.—AGGREGATE ANALYSIS OF UNSOUNDNESSES IN STALLIONS REFUSED CERTIFICATES DURING THE SEASONS 1907-8-9.

Unsoundnesses.	Draughts		Lights		Ponies		Totals	
	Number Examined, 1,299		Number Examined, 779		Number Examined, 558		Number Examined, 2,636	
	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected	Number Rejected	Percentage Rejected
Sidebone ...	262*	20·17	4	·51	—	—	266	10·09
Ringbone ...	40	3·08	14	1·79	6	1·08	60	2·28
Spavin (bone) ...	7	·54	25	3.21	2	·36	34	1·29
Curb	—	—	19	2·44	10	1·79	29	1·10
Bog Spavin and Thoroughpin	17	1·31	8	1·03	—	—	25	·94
Cataract (eye) ...	—	—	—	—	1	·18	1	·04
Roarer	—	—	2	·26	—	—	2	·08
Totals ...	326	25·10	72	9·24	19	3·41	417	15·82

* Thirteen horses rejected for other causes also had Sidebone, making a total of 275 draught horses with Sidebone.

or other of the listed unsoundnesses. The examination has not been confined to high-class horses. Practically all horses standing for public service in the State have been examined, and as showing the

range as regards quality it should be mentioned that 265 (10 per cent.) of the total number examined have been refused the Government certificate on the ground that they were below a reasonable standard for Government approval as regards breed, type, and conformation.

There has been examined, therefore, it may be claimed a sufficiency both as regards numbers and type from which to generalize concerning the incidence of the various unsoundnesses in different breeds or types, the age-period of their development, and, in a lesser degree, their occurrence in certain families of horses and non-occurrence in others.

Incidence of Unsoundness as regards Breed.

An analysis of the unsoundnesses met with in the different breeds of horses will be found in the accompaying tables. The first three tables relate to examinations made in the separate years, 1907, 1908 and 1909; the fourth table gives the aggregate figures regarding horses examined to date:—

Among the conclusions to be drawn from the results set out in the above tables, the following are of first importance:—

A.—Concerning Breeds of Horses—

(1) That hereditary unsoundness exists in draught horses to a much greater extent that in other breeds—to two and a half times greater extent that in light horses, and eight times greater than in ponies;

(2) That light horses are much less subject to hereditary unsoundness than draught horses, but much more so than ponies;

(3) That ponies are, of all breeds, least subject to unsoundness of an hereditary character.

B.—Concerning Hereditary Unsoundnesses.

(1) As regards *Sidebone* that—(*a*) Ponies do not develop sidebone as a form of hereditary unsoundness; (*b*) in light horses sidebone is so rare that it may be considered negligible; (*c*) this form of unsoundness is practically confined to draught horses, and is the most common of all forms of hereditary unsoundness in draught horses, and further that its incidence in draught horses is practically six and and a half times greater than that of any other hereditary unsoundness, either in draught horses or in any other breed.

(2) As regards *Ringbone* that—(*a*) In ponies and light horses the occurrence of ringbone is rare; (*b*) in draught horses ringbone is, next to sidebone, the most common form of hereditary unsoundness.

(3) As regards *Bone Spavin*—that this form of unsoundness—(*a*) Is practically confined to light horses; (*b*) is the most common form of hereditary unsoundness in light horses; (*c*) is so rare in ponies and in draught horses as to be regarded as practically negligible.

(4) As regards *Curb* that—(*a*) Curb may be regarded as being an hereditary unsoundness in light horses and ponies only; (*b*) curb is the most common form of hereditary unsoundness in ponies; (*c*) curb is rare in draught horses and negligible as a form of hereditary unsoundness.

(5) As regards *Bog Spavin*, *Thoroughpin*, *Cataract*, and *Roaring*, the figures are insufficient for any reliable conclusions to be drawn.

Age-period of Development of Unsoundness.

No horses under two years old have been examined. Next to aged horses (six years and over) the age at which the greatest number has been submitted is three years. The excess of three-year-olds over four- and five-year-olds, is accounted for by the fact that during the second and third years there was the influx of an additional crop of colts of this age entering on a stallion career. The figures in some cases (*e.g.* ponies), and as regards the more uncommon unsoundness, are scarcely sufficient from which to generalize as to the age-period of development of unsoundness. As regards the more common unsoundness, however, it will be seen from the tables given below, that the percentage proportion of unsoundness is least in two- and three-year-olds and increases each year until the age of maturity, at which age-period (six years and over) the greatest percentage of unsoundness is found in all breeds. Indeed, it is quite likely that the proportion of unsoundness in aged horses is even greater than is shown in the tables, for the reason that a large number of horses past a showing age, and which were known by their owners to be unsound, have not been submitted for examination.

Evidence of Hereditary Character of Sidebone.

Amongst light horses only four (·51 per cent.), and amongst ponies none, have been found to have sidebone; so that the records as regards these classes are of no positive value in estimating the hereditary character of the unsoundness. As negative evidence, however, the fact of so infinitesimal a proportion of the light breeds being found affected is of the greatest significance, especially when it is remembered that these horses are, by the nature of their work and paces, subject in a much greater degree than draught horses to one of the alleged principal exciting causes of ossification of the lateral cartilages —viz., concussion.

No thoroughbred horse and no pony have been found affected with sidebone. The four light horses in which it has been found have all shown some signs in their type and conformation of admixture of draught blood. One notable instance of this was the imported English hackney, "X. G.," rejected for sidebone. His round nuggety conformation, broad flat feet, round bone, fetlock tuft, long curly hair growing from the coronets, and his high but laboured action all proclaimed the bar sinister of draught horse blood to such an extent as to belie his published pedigree. Another of these sidebone light horses, "M. G.," although having "light" characteristics at the time of examination, has been found, according to his breeding, to be actually a draught horse.

By the time the first hundred or so of draught horses had been examined, it appeared evident that valuable information concerning the transmission from sire to son of a predisposition to the formation of sidebone could be obtained. To that end I determined that the pedigrees and relationship of the different horses examined should be ascertained at the time of examination. This has been done, and as

The tables referred to are as follows:—

TABLE V.—AGE-PERIOD OF UNSOUNDNESSES IN DRAUGHT HORSES.

Unsoundness	2 years				3 years				4 years				5 years				6 years and over				Totals			
	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.
	58	40	18	31·08	454	365	89	19·60	208	139	64	31·52	135	86	49	36·28	449	245	204	45·48	1,299	875	424	32·63
Sidebones	..	..	3	5·17	..	..	52	11·45	..	..	37	18·23	..	..	27	20·00	..	..	143	31·84	..	..	262	20·22
Ringbones	..	..	..	..	..	..	4	·88	..	..	5	2·46	..	..	4	2·97	..	..	27	6·03	..	..	40	3·05
Spavin	..	..	..	..	..	..	2	·44	..	..	..	..	..	..	3	2·22	..	..	2	·44	..	..	7	·53
Bog spavin, &c.	..	..	..	..	..	..	6	1·32	..	..	4	1·97	..	..	1	·74	..	..	6	1·33	..	..	17	1·29
Totals	..	58	..	3	5·17	454	..	64	14·09	208	..	46	22·66	135	..	35	25·93	449	..	178	39·64	1,299	..	326	25·09

TABLE VI.—AGE-PERIOD OF UNSOUNDNESSES IN LIGHT HORSES.

Unsoundness	2 years				3 years				4 years				5 years				6 years and over				Totals			
	Exd.	C.	N.C.	Re-jects per cent.	Exd.	C.	N.C.	Re-jects per cent.	Exd.	C.	N.C.	Re-jects per cent.	Exd.	C.	N.C.	Re-jects per cent.	Exd.	C.	N.C.	Re-jects per cent.	Exd.	C.	N.C.	Re-jects per cent.
	22	17	5	22·7	130	101	29	22·8	102	83	19	18·6	80	68	12	15·0	445	362	83	18·65	779	631	148	18·99
Sidebones	..	..	..	..	..	..	1	·76	..	..	..	..	..	..	..	..	..	..	3	·67	..	..	4	·51
Ringbones	..	..	..	..	..	..	1	·76	..	..	1	·98	..	..	..	..	..	..	12	2·68	..	..	14	1·79
Spavin	..	..	..	..	..	..	3	2·30	..	..	2	1·96	..	..	2	2·50	..	..	18	4·02	..	..	25	3·61
Bog spavin, &c.	..	..	..	..	..	..	1	·76	..	..	1	·98	..	..	2	2·50	..	..	4	·90	..	..	8	1·08
Curb	..	..	4	18·18	..	..	5	8·86	..	..	3	2·94	..	..	1	1·25	..	..	6	1·86	..	..	19	2·44
Roarer	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	·45	..	..	2	·26
Totals	..	22	..	4	18·18	130	..	11	8·44	102	..	7	6·86	80	..	5	6·25	445	..	45	10·08	779	..	72	9·24

Table VII.—Age-period of Unsoundnesses in Ponies.

Unsoundness	2 years				3 years				4 years				5 years				6 years and over				Totals			
	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.
	18	10	8	44·44	102	73	29	28·48	79	61	18	22·78	70	60	10	14·28	289	244	45	15·57	558	448	110	19·71
Ringbones ..	..	..	..	..	..	..	1	·98	..	..	..	..	..	..	1	1·48	..	..	4	1·40	..	..	6	1·08
Curb	..	..	..	..	..	..	1	·98	..	..	8	3·79	..	..	3	4.28	..	..	1	1·04	..	..	10	1·79
Spavin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	·71	..	..	2	·36
Bog Spavin ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cataract	..	..	..	..	..	..	1	·98	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	·18
Total ..	18	..	..	..	102	..	3	2·94	79	..	3	3·79	70	..	4	5·71	289	..	9	3·15	558	..	19	3·41

Table VIII.—Age Period of Unsoundnesses in all Breeds (Draught Horses, Light Horses and Ponies).

Unsoundness	2 years				3 years				4 years				5 years				6 years and over				Totals			
	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.	Exd.	C.	N.C.	Per cent. N.C.
	98	67	31	31·63	686	539	137	19·99	384	283	101	25·80	285	214	71	24·91	1,183	851	332	28·07	2,636	1,955	682	25·87
Sidebones ..	..	..	3	3·06	..	..	54	7·87	..	..	37	9·63	..	..	27	9·48	..	..	146	12·35	..	..	267	10·09
Ringbones ..	..	..	..	..	..	..	5	·74	..	..	6	1·56	..	..	5	1·75	..	..	43	3·63	..	..	60	2·28
Spavin	..	..	..	..	..	..	5	·74	..	..	2	·52	..	..	5	1·75	.	..	22	1·85	..	..	34	1·29
Bog Spavin ..	..	..	..	..	..	..	7	1·01	..	..	5	1.81	..	..	3	1·05	..	..	10	·85	..	..	25	·94
Curb	..	..	4	4·08	..	..	6	·87	..	..	6	1·56	..	..	4	1·40	..	..	9	·76	..	..	29	1·10
Cataract (Eye) ..	..	..	..	..	..	..	1	·14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1·04
Roarer	..	..	..	..	..	..	..	..	..	..	..	.	..	..	..	..	..	..	2	·16	..	..	2	·08
Total ..	98	..	7	7·14	686	..	78	11·37	384	..	56	14·58	285	..	44	15·43	1,183	..	232	19·61	2,636	..	417	15·82

a result I am able to present a series of tables of family groups of horses examined—some families in which there is a great preponderance of sidebone in the progeny, and some the members of which are virtually all sound.

In perusing the tables of sideboned families, attention should be given to the ratio of sideboned to sound progeny. Such ratio in each case, when compared with the general percentage (20·17) of sideboned horses, as shown in the previous tables, will be found to be greatly in excess. Similarly, in the case of the sound families, only those have been tabulated in which the percentage of sound animals greatly exceeds the general percentage.

For the reason already mentioned—viz., that the influence of the dam in any given case cannot be calculated—the deductions to be drawn from these tables are not as exact as is desirable, but there is one family (*see* Table IX., Family "A") in which it would appear that when the horse was mated with mares belonging to a sidebone sire family, the offspring developed sidebones, but when mated with outside mares the offspring remained sound. Seven sons of this sire, "T. I.," have been examined. Three of these—viz., "C. M.," "I. M.," and "I. Q.," were ex-. "Q. of B." mares, and all of them were rejected for sidebone. The other four were ex-mares of sound sire blood, and were found sound.

Note.—(1) In the tables following, for obvious reasons, the actual names of the horses are not given. The names are indicated by the use of a cipher consisting of initial letters bearing a similar relationship in all cases to the actual names of the horses concerned. A duplicate series of tables containing the actual names, together with the cipher key, has been furnished to the Melbourne University examiners, the Minister for Agriculture, and the Editor of this journal.)

TABLE IX.—UNSOUND FAMILIES.*

Family "A."—Sire, Q. of B. (not examined).

Sideboned 24 (9 sons, 15 grandsons). Sound 15 (2 sons, 13 grandsons).

Remarks.—61·5 per cent. of examined progeny sideboned; 38·5 per cent. sound.
81.8 per cent. sons sideboned; 18·8 per cent. sound.
53·5 per cent. grandsons sideboned; 46·5 per cent. sound.

The influence of sound blood on the dam's side in the case of the grandsons may be presumed, each grandson only carrying one-quarter of "Q. of B." blood against three-quarters outside blood. This family is an instance of what has been observed throughout, viz., that the influence of the foundation sire, whether in the direction of soundness or unsoundness, lessens with each generation, unless there is introduction of sound or of unsound blood, as the case may be, on the dam's side in the younger generations.

Family "B."—Sire, T. Q. (not examined).

Sideboned 15 (8 sons, 7 grandsons). Sound 10 (4 sons, 6 grandsons).

Remarks.—60 per cent. of examined progeny sideboned; 40 per cent. sound.
66·7 per cent. sons sideboned; 33·3 per cent. sound.
53·7 per cent. grandsons sideboned; 46·3 per cent. sound.

Family "C."—Sire, Z. D. I. (not examined).

Sideboned 5 (4 sons, 1 grandson). Sound 1 (a grandson).

* Owing to want of space, these tables, which were set out in detail in the original, have had to be summarized.—EDS. *V. J.*

Family "D."—Sire, O. C. (not examined).

Sideboned 4 (3 sons, 1 grandson). Sound 1 (a son).

Family "E."—Sire, D. of the O." (not examined).

Sideboned 4 (3 grandsons, 1 great-grandson). Sound (*nil*).

Family "F."—Sire, U. D. (examined—sideboned).

Sideboned 3 (all sons). Sound (*nil*).

TABLE X.—SOUND FAMILIES.

Family "A."—Sire, T. M. (not examined).

Sound 35 (19 sons, 15 grandsons, 1 great grandson) Sideboned 7 (1 son, 6 grandsons).

Remarks.—83·3 per cent. of progeny sound; 16·7 sideboned.
95 per cent. of sons sound; 5 per cent. sideboned.
72·7 per cent. of grandsons and great grandsons sound; 27 per cent. sideboned.

Clearly the increase in number of sideboned grandsons over sons is due to the introduction of sidebone blood through the dams, especially seeing the preponderance of aged sound horses amongst the sons.

Family "B."—Sire, C. Q. (not examined).

Sound 30 (2 sons, 13 grandsons, 15 great grandsons). Sideboned 1 (a grandson).

Remarks.—The quality of soundness must have been particularly "dominant" in this sire, for it is not likely that 30 of the 31 dams of his stallion progeny were free from sidebones. The grandson, "Q. of O.," himself sound, is the sire of ten of the sound great grandsons.

Family "C."—Sire, M. E. (examined—sound).

Sound 19 (all sons). Sideboned 1 (a son).

Remarks.—It is regrettable that the pedigree of "H" (the sideboned son) on dam's side cannot be traced. She must belong to a pronouncedly sideboned family, seeing that her colt had well-developed sidebones at two years old, although got by sire whose every other son kept as a stallion is sound.

Family "D"—Sire, T. X. (not examined).

Sound 12 (all sons).

Family "E."—Sire, D. the T. (not examined).

Sound 11 (8 sons, 3 grandsons). Sideboned 1 (a grandson).

Family "F."—Sire, L. of L. (not examined).

Sound 10 (all grandsons). Sideboned *nil.*

Family "G."—Sire, J. I. (not examined).

Sound 10 (all sons). Sideboned 2 (both sons).

Remarks.—This may not turn out to be a particularly sound family. The percentage of sideboned sons is already 16·7, and amongst the sound sons there is a heavy proportion of two and three year olds, some of which may develop sidebones later on.

Family "H."—Sire, B. (not examined).

Sound 8 (7 sons, 1 grandson). Sideboned *nil.*

Family "I."—Sire, Q. S. (not examined).

Sound 7 (6 grandsons, 1 great grandson). Sideboned *nil.*

Family "J."—Sire, D. of the T. (not examined).

Sound 4 (all sons). Sideboned *nil.*

LOCATION OF SIDEBONE AS EVIDENCE OF HEREDITARY CHARACTER.

Concerning the frequency of occurrence of sidebone on the inside or outside of the foot, and as to which feet are more frequently affected, the following synopsis as regards the 275 sideboned horses is informative :—

Firstly, as to the number of feet affected—

40 horses had sidebone 1 foot only
214 ,, ,, 2 feet only
8 ,, ,, 3 ,,
13 ,, ,, 4 feet

Total ... 275 affected with sidebone.

Secondly, as to relative frequency in front and behind—

254 horses had sidebones in front only
2 ,, ,, behind only
19 ,, ,, both in front and behind

Total ... 275, of which 273 had sidebone in front and 21 had sidebones behind—a proportion of 13 horses affected in front to each 1 behind.

Thirdly, as to the relative frequency of near side and off side affection—

Of the above-mentioned 254 horses having sidebone in front—

197 horses had sidebones both fore		= 394 feet affected	
16 ,, ,,	near fore only	= 16 ,,	,,
41 ,, ,,	off fore only	= 41 ,,	,,
Total ... 254		451	

Of these 451 affected feet, 213 were near fore and 238 off fore, viz. :—197 + 16 = 213 near fore, and 197 + 41 = 238 off fore.

Fourthly, as to the relative frequency of sidebone on the inside and outside of the foot—

Of the above-mentioned 254 horses having sidebone in front only—

147 had 4 sidebones	(588 individual sidebones)	—294 inside	and	249 outside	
32 ,, 3 ,,	(96 ,, ,,)	36 ,,	,,	60	,,
46 ,, 2 ,,	(92 ,, ,,)	24 ,,	,,	68	,,
29 ,, 1 ,,	(29 ,, ,,)	9 ,,	,,	20	,,
254 horses sidebone in front	(805 ,, ,,)	363 (45·1 %) ,,		422 (54·9 %) outside	

(a proportion of 9 inside to 11 outside).

Of the 46 horses shown in this table as having two sidebones in front, 28 were affected on one foot only ; the remaining 18 had one sidebone on each foot, making 36 sidebones in all (18 × 8). Of these, 6 were inside and 30 outside. Therefore, the number of horses having sidebones on both feet was 197 (18 + 32 + 147). These 197 horses had 720 individual sidebones between them (588 + 96 + 36), distributed as follows :—

720 sidebones ... { 384 outside (53·3 per cent.).
336 inside (46·7 ,,).

48 more sidebones on outside than inside—a proportion of 8 (outside) to 7 (inside).

The outstanding features of the above figures are :—

(*a*) The great excess of sidebones in the fore-foot as compared with the hind—proportion 13 to 1.

(*b*) The preponderance of cases in which both fore were affected as against one-foot affection—proportion 10 to 3.

(*c*) The approximation of the incidence of sidebone in the near and off foot—proportion 9 to 10.

(*d*) The approximation of the incidence of sidebone on the inside and outside of the foot respectively—proportion 9 to 11, inclusive of single-footed sidebones; 7 to 8 for pair-foot sidebones only.

Concerning (*a*) it is reasonable to regard the excess of sidebones in front as positive evidence of the part played by concussion and strain of body weight as exciting causes of sidebone. More weight is borne during rest and greater concussion is sustained during movement by the fore limbs and feet than the hind limbs and feet, for two reasons: *Firstly*, the incidence of body weight on the fore feet is greater than on the hind; *secondly*, the column of bones of the fore limbs, being practically perpendicular from the elbow down, is more rigid than that of the hind limb, in which the angle formed by the tibio-metatarsal bones tends to lessen jar.

The effect of concussion in the production of splints might be adduced in support of the above conclusion. It is definitely recognized that the greatest exciting cause of "splints" in light horses is concussion. Their occurrence in the metacarpal region is, as compared with the metatarsal, in about the same proportion as recorded above concerning sidebones in the fore and hind feet respectively of draught horses. Incidentally, it may be mentioned that the form of hoof in which sidebone has been most frequently found, is that in which the wall—particularly at the sides—approaches the perpendicular. Such feet are also usually small, narrow, and blocky. Sidebones are seldom associated with large and spreading or broad and flat feet.

As regards (*b*) the fact of the sidebone occurring in both fore feet more than three times as frequently as in a single foot, indicates an intrinsic causation rather than causation by external violence, which would scarcely happen to both fore feet simultaneously.

Comment on (*c*) may be confined to the statement that the excess of sidebones found in the off feet, as compared with the near, is so slight (10 to 9) that it cannot be regarded as of any significance in the matter of determining the causation of sidebone. The observation, however, conflicts with the statement in Mollar and Dollar's *Veterinary Surgery*, that "the cartilage of the left foot suffers more frequently than that of the right."

Observation (*d*) is of considerable importance. The fact that the disparity between the incidence of sidebone on the outside and inside of the foot is so slight (only as 8 is to 7) would appear to indicate the falsity of a commonly held supposition, viz., that sidebone is regularly caused by an injury sustained through the dropping of the shafts on to the coronets when the horse is being unyoked from a dray, or from the coronets being trod on when working in a team. In the former case it is obvious that only the outside coronets could sustain injury, but in neither case can such a cause be admitted as regards the horses under review. Being stud horses and many of them of high value, it may be asserted that not one in ten of the draught horses examined had even been yoked to a dray or harnessed in a team, or even worn a collar.

On this theory of injury as a cause of sidebone, it may be remarked that the number of occasions with any evidence of external injury

having been sustained, such as a scar, is practically negligible; on the other hand, some of the draught sires and many of the trotting sires examined have shown scars over the seat of sidebone, but without any ossification of the cartilage having occurred. This was notably the case with the pony "D. S.," whose near fore coronet outside had apparently at one time been literally cut to pieces, yet without even stiffening the cartilage. In cases of quittor it frequently happens that the inflammatory process involves the lateral cartilage to the extent that suppurating sinuses may pierce it, and the cartilage still remains free from ossification. I doubt whether sidebone is ever caused by external violence *per se*, and I do not think that even deliberate bruising of the coronets of a light horse by severe hammering would result in ossification of the underlying cartilage. Amongst hundreds examined, I have never seen any specimen showing evidence of ossification having commenced at the summit or margins of the cartilage. It always commences at the base where the cartilage is joined to and rests on the wing of the pedal bone and gradually extends upwards throughout the substance of the cartilage to the summit and borders. Many specimens are in my possession showing all stages of growth of sidebone from the very commencement at the base of the cartilage, through gradations in size of the ossified portion to the fully-formed sidebone involving the whole of the cartilage. I have never been able to find a specimen of bony formation at the top of the cartilage with normal cartilage in between the summit and base. I have one specimen in which the sidebone had become detached from the wing of the *os pedis* and formed a false joint, but the indications on the bones are that a fracture had occurred subsequent to the development of the sidebone, and not that the ossification had commenced high up in the cartilage and extended downwards with failure to unite with the basilar process of the wing of the *os pedis*.

It, doubtless, is the case that many draught horses when worked in pairs or in teams abreast are trodden on at the seat of the sidebone, and that some of such horses may subsequently develop sidebones. Many so trodden on, however, do not develop sidebones, and the logical inference is that when sidebones develop after actual or supposed injury, they develop despite the injury, and not because of it. In such cases sidebones would doubtless have formed whether injury had occurred or not; but where injury has occurred and sidebones have been noticed afterwards, the injury is credited with being the cause, although the sidebone may have been present, but unnoticed, at the time the injury was sustained.

Since the attention of horse-owners has been so pointedly called to the subject of sidebones by the results of the Government examination of stallions, many of them have given me instances within their own experiences on their own farms which corroborate the conclusions above set out—cases in which certain horses on the farm related to one another have all developed sidebones, but the remaining horses on the farm, worked and treated in exactly similar fashion, but unrelated to the sideboned horses, have remained sound. Mr. K. C., of Y., has five descendants of one mare, all bred on his farm and all sideboned, while seven other home-bred horses, unrelated to the mare in question, but which have been reared and worked under the same conditions as her descendants, have remained sound.

WORK VERSUS HEREDITY IN THE PRODUCTION OF SIDEBONES.

The only set of figures bearing on the incidence of sidebone which I have come across in any veterinary text-book are those by Lungwitz, quoted in Mollar and Dollar's "Veterinary Surgery." Lungwitz examined 1,251 horses, and furnished the following table of results :—

Description	Number of Horses Examined	Number affected with Sidebone	Percentage	Remarks
Belgian cart horses	98	68	69·5	Working only on hard pavements
Danish carriage horses ...	120	25	31	" " "
Heavy riding horses	388	36	9	Working on heavy ground and partly on hard pavements
Heavy riding horses	132	—	—	Working on light sandy soil
Light riding horses	133	8	6	Working on light ground
Riding horses (various weights)	140	3	2	Working on light ground
Military horses	200	1	0·5	Working on medium heavy ground
Officers' horses (heavy) ...	40	3	7·5	Working on varied surfaces
	1,251	144	14·4	

The figures in this table relate to working horses only, not to stud horses, and do not throw any light on the question of hereditary influence in the occurrence of sidebone. They support the conclusion set out above as to sidebone being essentially an affection of draught horses, but one false inference may be drawn from the figures—viz., that the development of sidebone is consequential on the character of the work performed by the horse. Rather is it that the horses which are used for draught work on hard pavements and heavy ground are of the class that are hereditarily predisposed to the development of sidebones. In support of this latter view the fact must needs be mentioned that all the horses dealt with under the Victorian Government scheme were stud horses. Few of them had done any kind of work, and practically none had worked on pavement. The roads travelled by stallions when doing their season have an earth surface frequently cushioned with dust or grass; in the vicinity of the larger towns only are the country roads metalled or macadamized.

Another interesting fact as bearing on the falsity of the view that sidebones are caused by the use of calkin or high-heeled shoes, is that practically all the draught horses examined were shod without heels, the practice of shoeing stallions with flat shoes being general throughout this country.

EVIDENCE OF HEREDITARY CHARACTER OF OTHER UNSOUNDNESSES.

Table IV. shows the total number of rejections for ringbone, bone spavin, curb and bog spavin to have been respectively 60, 34, 29, and 25, as against 275 cases of sidebone. The difficulty, therefore, of revealing evidence of hereditary transmission of these other unsoundnesses as compared with sidebone is in ratio to the lesser numbers available for analysis in each case. There is only practically one-fifth

of the number of the cases to work on in the case of ringbone, one-ninth in the case of bone spavin and curb, and one-eleventh in the case of bog spavin.

Nevertheless, relationship between a varying number of horses found to have these unsoundnesses respectively may be cited.

RINGBONE.—Of the forty draught horses rejected for ringbone, five belong to one family and four to another.

The five comprise four sons, and one g.-g. son of the sire Q. of B. In the other family the four rejects for ringbone are grandsons through their dams of the sire B.

BONE SPAVIN.—Relationship between the horses rejected for bone spavin has not, up to the present, been found to exist sufficiently close as to warrant the submission of any instances as evidence of hereditary influence as the causation of this particular unsoundness.

CURB.—In regard to curb, seven families have been encountered in which near relatives have been found affected. Particulars of these are:—

Family 1.—Sire and one son examined both having curbs.

Family 2.—Three sons having curbs (sire not examined).

Families 3 *and* 4.—Both sires sound; two sons curbed in each case.

Families 5 *and* 6.—Sires not examined; in each case two sons with curb.

Family 7.—One son and one grandsire with curb (sire not examined).

Bog Spavin.—In one sense, the evidence of hereditary influence in the causation of bog spavin (including thoroughpin) is more pronounced than in respect of sidebone. There are no less than nine families in which a varying number of descendants have been affected with bog spavin.

[The horses referred to have not necessarily been rejected on account of this particular unsoundness—bog spavin.]

In the case of *Family* 1, five sons have had bog spavin.

In *Family* 2 three sons had bog spavin.

In *Family* 3 three sons had bog spavin, and two other sons examined were sound.

In *Family* 4 two sons and one grandson had bog spavin.

In three other cases (*Families* 5, 6 and 7) two sons of the same sire had bog spavin.

In one case (*Family* 8) a sire and son have been examined and rejected for bog spavin.

In one case (*Family* 9) a son and grandson of one sire have been rejected for bog spavin.

Review.

A Text-book of Veterinary Anatomy. By Septimus Sisson, S.B., V.S., Professor of Comparative Anatomy in the Ohio State University, Columbus. Octavo, pp. 826, with 588 illustrations. Cloth. Price 30s. net. Published by Messrs. W. B. Saunders and Co., Philadelphia and London, 1910.

It is a long time since any work on systematic veterinary anatomy has been published in the English language, and during that time great strides have been made, and many changes have taken place, both in the methods of preparing subjects and in nomenclature. As a result of the former, specimens having been frozen or hardened by injection of formalin, our knowledge of reviews concerning the natural shape of many viscera has been modified.

The change of nomenclature is of very great importance. Up to the present practically all the text-books in the English language have adopted different systems. The author of the volume under consideration has decided to adopt the terms agreed upon by the congresses of anatomists at Baden and Stuttgart, a very commendable step, since it will tend to minimize confusion of terms, for the same system is likely to be adopted by comparative anatomists throughout the world. The author, however, considers it wise to adopt the change gradually, and has made some concessions, and while adopting the new names in many places, he retains many of the old ones, giving the new ones in parentheses. There is probably much to be said in favour of this view, but we think it would probably have been better to have made the change complete at once, giving the old names in parentheses. The change will undoubtedly cause some confusion to clinicians for a time, as, for example, in reference to the "Flexor metatarsi" muscle. This name can no longer be found in the index, the muscle being regarded more correctly as two muscles, the tendinous portion being called the "Peroneus tertius," and the muscular portion the "Tibialis anterior." Another example is the complete change in the names of the bones of the carpus and tissues, names much more reasonable, but at first likely to cause confusion. We would suggest an addition to the next edition of tables of synonyms which could be easily referred to, and in that case no transitional stage of nomenclature would be necessary.

The various descriptions are very lucid, and easily followed, and the illustrations, many of them in colour, are excellent, and will be found of the greatest possible assistance to both anatomists and clinicians. Many of the illustrations are original, but a very large proportion are taken (with full acknowledgments) from the excellent German works of Ellenberger and Baum and Schmaltz. The work also includes useful tables of dentition for all the domesticated animals.

The type, binding, and finish of the book are worthy of what is likely to become a standard work. It should be obtained by all students and practitioners.

Translations.

JOINT AFFECTIONS FOLLOWING STRANGLES.

By Chief Veterinary Surgeon BREITENREITER.

The service horse Canaille of the 3rd squadron of Hussars fell ill with strangles on October 26, 1909. There was loss of appetite, dry cough, nasal discharge, swelling of the maxillary glands, and later abscess formation. A week later fever was present: the highest temperature registering 39·7° C. After fourteen days nasal discharge and cough ceased; appetite returned, and the horse was considered convalescent. Suddenly on November 25 food was refused, and the horse stood listlessly in his stall; when put over he moved stiffly and with pain. Examination showed hot, painful swellings of the left fore fetlock and both hock joints. Rectal temperature was 39° C. Fever and loss of appetite continued five days and afterwards passed away; at the same time the swelling of the fore limb disappeared, whilst those on the hock joints kept reappearing now on the right and again on the left articulation. The joint affection was accompanied each time with fever, loss of appetite and severe lameness. In the middle of January, 1910, the joint trouble ceased; it did not recur again, and the horse was discharged cured at the end of February, although there was slight thickening of both hock joints which has not disappeared even to-day. Lameness or illness have not since been noticed. Treatment consisted in camphor spirit bandages and inunction of of ichthyol ointment. Internally salicylate of soda was given; any special effect from these agents could not, however, be established with certainty.

(*Zeitschrift für Veterinärkunde.*)

THE ACTUAL RESULTS OF IMMUNIZATION AGAINST HOG CHOLERA OR SWINE FEVER.

Indexed B. A. I.

By Professors HUTYRA and WETZL.

The experiences with immunization against hog cholera having given some favourable results, the procedure has been introduced into practice.

The immunizing serum is produced in a special establishment. Some pigs having resisted natural or accidental infection from the plague, receive in one injection under the skin 1,000 to 1,200 c.c. of virulent blood, or on two occasions 500 to 600 c.c., in a space of two to four weeks. These hyperimmunized animals are bled at the tail after three or four weeks; a week later they are sacrificed by being bled to death. At first the blood was defibrinated and mixed with carbolized water, but recently it has been found that the serum of treated animals answers quite as well.

One injects 7½ c.c. of serum for pigs of less than 20 kilogrammes (44 lb.), 10 c.c. for those that weigh 20 to 40 kilogrammes, and 15 c.c. for animals weighing more than 40 kilogrammes. The action of the serum has been proved in 106 experiments.

In seventy-one piggeries, having contained 7,609 infected animals, the swine appearing healthy were inoculated with a mortality rate of only 1·7 per cent. In forty-two of these piggeries 3,125 inoculated pigs furnished no case of the complaint. The mortality was 15·7 per cent. for fourteen other standings (1,611 inoculated), 23·7 per cent. in five (253 inoculated), 36·4 per cent. in eight (603 inoculated); in these same experiments animals not inoculated furnished respectively a mortality rate of 44·8, 47·2 and 59·4 per cent.

From these results it is shown that effects are most favourable in places where the disease is of an attenuated character.

In eight herds inoculation remained without result, the mortality cypher being about the same for the inoculated and non-inoculated (59·9 and 57·9 per cent). In one of these piggeries the plague was complicated with an outbreak of erysipelas; in four others intestinal lesions were completely absent at the autopsy, and there was a prevalent septicæmia without a doubt.

The results are much less favourable after inoculation of ailing swine, although the inoculated furnish a lower mortality rate than those not treated. It is very probable that inoculation only takes effect at the commencement of the plague when no secondary infection has been produced.

(*Allatorvosi Lapok.*)

THE ACTUAL STATE OF OUR KNOWLEDGE ON THE *ROLE* OF FLIES IN THE DISSEMINATION OF PARASITIC MALADIES AND ON THE MEANS EMPLOYED AGAINST THEM.

By B. GALLI-VALERIO,

The harmful *rôle* of *Muscidæ* is clearly established to-day. In the larval state flies can adapt themselves to live on and in the animal body, provoking cutaneous myases, nasal, buccal, auricular, intestinal, vesical. In the adult state they act in a direct fashion by the irritation which they provoke, or in an indirect fashion by conveying animal or vegetable parasites which they deposit on the skin or mucosa of animals, and above all in food and drink. Flies can even explain the existence or reappearance of an illness, if one refers to the works of Cao, who proved that germs ingested by the larvæ can be found again inherent to the excrement or eggs of perfect insects.

We will confine this general *exposé* to facts pointing to the transmission of animal parasites. Cobbold was of opinion that flies could convey the eggs of *Fasciola hepatica* and spread them in water. Grassi found the eggs of *Tænia solium* and *Trichocephalus trichiurus* in the intestine of flies which had drunk water soiled by these parasites.

Flies have been accused of transmitting tracheoma, frambœsia, and variola; these facts are still discussed.

From different trials experimenters have recovered tubercle bacilli from the intestines of flies captured in the rooms of the tuberculous; all have published positive results and generally in an increased proportion (Spilmann and Haushalter, Hoffmann, Alessi), Galli-Valerio

only reports old researches; the most recent are 1888, and the authors have perhaps confounded acido-resistant bacilli with tubercle bacilli.

The *rôle* of flies in the transmission of anthrax has long occupied attention. It is not doubtful that it is possible to refind the bacterides on the bodies or in the intestines of flies which have been in contact with contaminated products, but their *rôle* as a vehicle of contagion ought to be well restrained. In the dissemination of cholera, typhoid fever, and dysentery, flies play an important *rôle;* food, notably milk, can be contaminated by flies that have been in contact with virulent fæcal matter. Joly considered that glanders in Guadaloupe was spread by flies, Jäger that symptomatic anthrax is so spread. Chloride of lime on the dungheaps (which are the homes of flies), even in thin layers, produces good results.

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Books and Periodicals, &c., Received.

Encyclopædia of Sport (Heinemann), Parts IX. and X.; The Gulf States Farmer (Louisiana); The American Journal of Veterinary Medicine; Proceedings of the Royal Society of Medicine; Bulletin of the Bureau of Sleeping Sickness; Agricultural Journal of the Cape of Good Hope; Journal of Department of Agriculture of Victoria.

Letters and Communications, &c.

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